CONTRA COSTA COUNTY

DRAFT
ENVIRONMENTAL IMPACT REPORT

FOR THE

TASSAJARA PROJECT

COUNTY FILE GPA #930008 and RZ #943022

SCH #93043038

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VOLUME I
Chapters 1-4.7

2.0 SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Table 2-1 summarizes the significant impacts of the proposed project and mitigation measures required to reduce these impacts. The third column of the table indicates whether the impact can be mitigated to a less-than-significant level. A complete discussion of project impacts and mitigation measures can be found throughout Chapters 4.0 and 5.0 in the text of the EIR. Less-than-significant impacts have also been identified in these chapters. CEQA does not require mitigation for less-than-significant impacts; however, in some cases, recommendations were made for consideration as conditions of project approval. Wherever relevant, secondary impacts, as a result of mitigation implementation, have been identified throughout Chapter 4.0.

The following definition is provided to help clarify the concept of Significant Effects, as required by CEQA Guidelines, 1994, Section 15382.

> "A substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. An economic or social change by itself shall not be considered a significant effect on the environment. A social or economic change related to a physical change may be considered in determining whether the physical change is significant."

The Tassajara project would create the following significant impacts that cannot be mitigated to a less-than-significant level: loss of an agricultural and visual resource; exceeding regional air quality standards; exceeding the wastewater discharge allocation, and exceeding the community park/recreation standards during the first phase of development.

The significant unavoidable impacts identified in an EIR (CEQA document) require the Lead Agency and each Responsible Agency to make a finding (CEQA Guidelines, Section 15091 and Public Resources Code, Section 21083 and 21087) for each significant unavoidable adverse impact, and a statement of overriding considerations (CEQA Guidelines, 1994, Section 15093) for the project, if approved.

The responsibility for implementing the mitigation measures will be identified in a Mitigation Monitoring Program that will be prepared after publication of the Final EIR.

TABLE 2-1
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
LAND USE AND PLANNING POLICY		
4.1-1 Potential incompatibility with adjacent land uses.	All of the following mitigation measures are required to reduce the impact to a less-than-significant level.	
	(a) The proposed SM designation should be reduced to SV designation on the McLaughlin/Bohn, Howe, Krikorian/ Ecker/White and Ibsen properties.	Yes
	(b) Density proposed at the eastern end of the Highland Road development should be reduced from SM to SL or SV. This area includes the Richards, McMullan, D'Elia and portions of the Rasmussen property.	Yes
	(c) Density should be reduced in the area adjacent to the Urban Limit Line from SM to SL or SV.	Yes
	(d) The Design Guidelines should be revised to include the following design measures to reduce potential land use compatibility problems in the area of the Blackhawk east gate: • Limit development in the northern village center to two stories in height; • Implement design guidelines relative to setbacks and architectural treatment; • Site commercial structures so front elevation faces Camino Tassajara and Blackhawk;	Yes

Potentially Significant Impacts		Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
		• Establish parking areas behind the buildings to reduce the number of street lights in view of Blackhawk; and • Use only downward pointed street lamps to avoid light trespass and glare.	
4.1-2	Redesignation of Bruce Drive, Penny Lane, Johnston Road and area adjacent on the east to SV could lead to an intensification of development and a disruption of existing land use.	The existing Agricultural Lands (AL) designation and agricultural zoning on Bruce Drive, Penny Lane and Johnston Road subarea should be maintained to ensure that rural residential and agricultural uses are continued.	Yes
4.1-3	The Tassajara plan does not provide a compatible interface with adjacent communities.	All of the following mitigation measures are required to reduce the impact to a less-than-significant level.	
		(a) The use of open space buffers and landscaping should be expanded along the plan area's southern boundary with the East Dublin Specific Plan and the project's west boundary with Danville. Open space should extend north from the County line a minimum of 500 feet to create a distinction between communities.	Yes
		(b) Dublin should be urged to require a buffer zone in Alameda County that would help in the transition between the two jurisdictions.	Yes
		(c) The use of open space buffers, landscaping and distinctive architecture should be expanded at the project's western boundary.	Yes
		(d) The Tassajara Design Guidelines should be modified to include specific entry designs for Camino Tassajara at the County line and at the project's western boundary.	Yes

Potentially Significant Impacts		Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
4.1-4	Internal land use compatibility problems may arise where housing is sited adjacent to commercial and park/recreational facilities.	The following mitigation measures are required to reduce the impact to a less-than-significant level.	
		(a) Adequate buffers between commercial and residential land uses should be provided to effectively reduce exterior noise levels to County standards. Noise sources, such as loudspeakers or menu boards, should be directed away from residential areas, equipment noise should be buffered and deliveries should be restricted to daytime hours.	Yes
		(b) Recreational activities should be restricted to daylight hours. If the demand for playing fields increases to the point where lights are considered, thereby extending playing time, a noise and lighting study should be conducted to determine the impact to adjoining residents. Appropriate mitigation measures, such as lighting only fields that are located farthest from residences, could be a consideration.	Yes
4.1-7	The Tassajara plan does not adequately address the long-term management and maintenance of open space in the plan area.	The following mitigation measures are required to reduce the impact to a less-than-significant level.	
		(a) The Tassajara Preliminary Development Plan should be revised to designate open space areas as either "public open space" or "private" open space.	Yes
		(b) Prior to final approval of any plan for development in the Tassajara Valley or portion thereof, an agency or agencies should be designated and funded to manage and maintain all land designated as "public" open space. Landscape, maintenance and access guidelines should be developed and required for all "private" open space areas.	Yes

	Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
4.1-8	Conversion of approximately 232 acres of prime farmland to urban and park and recreation uses. ***This would be a significant unavoidable impact.***	No mitigation measure is available.	No
4.1-9	The proposed development does not provide an adequate buffer zone for the agricultural land to the east.	The following mitigation measures are required to reduce the impact to a less-than-significant level.	
		(a) The density of any development bordering agricultural land that is adjacent to the ULL should be decreased. This would include density reductions along Highland Road (from SM to SV within 200 feet of the ULL) and on the Brown property (from SM to SV). Density allowed should be near the lower SV range (0.2 to 0.9 dwelling units per net acre), not more than 0.5. Proposed P-1 zoning would allow this density to be clustered away from the ULL boundary.	Yes
		(b) Fencing and berming standards should be included in the Design Guidelines and Development Standards for new development bordering adjacent agricultural lands. Additionally, a 200-foot-wide buffer should be provided west of the ULL.	Yes
4.1-10	Development of the Tassajara Valley could transfer development pressure to areas further to the east and endanger the loss of additional agricultural land.	Developers should pay a fee to an Agricultural Soils Land Trust prior to approval of individual tentative maps. This fee is to be used for the purchase of the development rights from the owners of farmlands east of the ULL. This fee could be based on the amount of acreage in cultivation or grazing use in 1996.	Yes

	Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
GEOLOGY/SEISMICITY/SOILS			
4.2-1	Portions of the PDP may be inconsistent with *General Plan* policies restricting extensive grading of slopes greater than 26 percent and slope stability.	The following mitigation measures are required to reduce the impact of General Plan inconsistency to a less-than-significant level.	
		(a) Substantially reduce the lot yield in Area D to provide flexibility needed to reduce grading, and apply the "hillside guidelines" and "supplemental hillside guidelines" to this portion of the site.	Yes
		(b) Three development areas labeled SV on the east side of Camino Tassajara in Area H should be shown as open space on the General Plan and Preliminary Development Plan unless the developable area can be more accurately identified by geologic/geotechnical studies.	Yes
4.2-2	Development of the proposed project will require mass grading of hillsides to create stable areas suitable for development.	All of the following mitigation measures are required to reduce the impact of mass grading to a less-than-significant level.	
		(a) Gradient criteria for cut and fill slopes as recommended by Engeo should be required of future applications when developing the project site. Any conflicts between the future grading plans and these criteria should be interpreted as evidence that the plan is inconsistent with grading criteria for the project.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(b) Residential unit(s) at the toe of a slope which result in high cut slopes, or which reduce the stability of a broad area upslope, should be carefully analyzed for General Plan consistency during processing of the final development plans. Alternatives to such grading should be evaluated (e.g., split level pads; custom-designed hillside homes with grading limited to the footprint of the foundation area and driveway; reduced lot yield, etc.).	Yes
	(c) Any grading which is proposed on a parcel prior to recording a final subdivision map (e.g., balance areas) should be reviewed to ensure it does not conflict with the planning options for the site, and that graded area is stabilized and protected from erosion.	Yes
	(d) Grading within open space lands should be contour-rounded to mimic natural terrain features, mantled with topsoil and revegetated.	Yes
4.2-3 Faults on the site have potential to cause significant damage to improvements.	The design level geotechnical and geologic studies, which are a normal part of the subdivision process, should include investigation aimed at providing information on the location, width, engineering character and activity status of faults which traverse lands proposed for development.	Yes
4.2-4 Strong to violent earthquake ground shaking on active fault zones in the region could cause significant damage to improvements, and in extreme cases, loss of life.	All of the following mitigation measures are required to reduce the impact of ground shaking damage to a less-than-significant level.	

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(a) Submit an analysis of the liquefaction potential for alluvium on the valley floor areas with applications for approval of final development plans. The analysis should be especially rigorous for lots on the perimeter of major creek channels. The methodology, sampling and other procedures should be designed after consultation with the County geologist. Where liquefaction potential is found to exist, this hazard should be mitigated or the land affected should be retained as open space on the project.	Yes
	(b) Appropriate grading and design should be used to reduce the secondary effects of ground shaking to structures and infrastructures. Cut-and-fill slopes should be designed to enhance stability of the site under seismic conditions. Measures to reduce the potential significant impacts of the secondary effects of ground shaking include: 1) slope inclinations consistent with the recommendations of the Engeo report, justified by stability analysis at the time of the design-level geotechnical investigation; 2) removal or repair of landslides underlying proposed lots which have the potential to affect downslope project improvements; and 3) installation of subsurface drainage.	Yes
	(c) Engineered retention structures and surface and subsurface drainage improvements should be used to improve the stability of potentially unstable colluvium not entirely removed in cut slopes. Engeo proposes use of buttress fill debris benches at the toes of all major cut and fill slopes. These buttresses provide a necessary buffer between open space and developed lots.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(d) Engineered fills on the project site should be properly designed with keyways and subsurface drainage, and adequately compacted (i.e., minimum 90 percent relative compaction as defined by ASTM D1557) to significantly reduce both seismically induced and natural fill settlement.	Yes
	(e) All roads, structural foundations and underground utilities should be designed to accommodate estimated settlement without failure, especially across transitions between fills and cuts.	Yes
	(f) Final design of the proposed improvements should be made in conjunction with a design level geotechnical investigation submitted to the County for review prior to issuing any permits. This investigation should incorporate stability analysis of both existing and reconstructed project area slopes.	Yes
	(g) Project area slopes should have a factor of safety greater than 1.1 under pseudostatic conditions (i.e., assuming maximum possible groundwater levels during the life of the project and earthquake shaking).	Yes
4.2-5 Landslides on the site have the potential to cause significant damage to improvements and, in extreme cases, loss of life.	All of the following mitigation measures are required to reduce the impact of potential landsliding to a less-than-significant level. One or more of the listed approaches should be selected by the project geotechnical engineer, as appropriate, on the basis of the site-specific, design-level geotechnical investigation.	

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(a) The design-level geotechnical report must address the impacts of slope instability with respect to planned improvements. These can be significantly reduced or, in many cases, prevented by recognition of the conditions, and by one or more of the following, as appropriate to specific areas of the site: • specific improvements to remove/stabilize landslides and areas of creeping soils within or affecting proposed lots. Where corrective grading is not economically feasible or environmentally acceptable planned improvements must be set back from those areas; • impact deflection or catchment structures below unmitigated landslide or swale areas; and appropriate foundation design.	Yes
	(b) A design-level geotechnical and geologic investigation report should be submitted to the County with subdivision applications. These reports must address the debris flow potential and the need, if any, for debris catch basin(s), deflection structures, building setbacks or other measures in areas of debris flow potential. Current research on the landslide hazard potential of colluvium-filled swales indicates that surface and subsurface drainage is effective in preventing landslides.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(c) In areas of development on, or adjacent to, existing landslides, slope repairs should include removal of unstable or compressible slide debris, excavation into underlying competent bedrock, construction of subsurface drainage measures, replacement with compacted engineered fill, construction of surface drainage measures, and planting with erosion-resistant vegetation, as recommended in the design-level geotechnical investigation report.	Yes
	(d) Surface drainage control measures should be incorporated for any areas of remedial work associated with slope repairs.	Yes
	(e) The design-level geotechnical and geologic investigation submitted with individual tentative subdivision maps must clarify the proposed mitigation of landslide hazards, and address how improvements at the toe of slides will stabilize upslope areas.	Yes
4.2-6 The potential failure of proposed cut-and-fill slopes could cause significant damage to improvements.	All of the following mitigation measures are required to reduce the impact from failure of cut and fill slopes to a less-than-significant level.	
	(a) Use of 2:1 gradients is restricted to fill slopes less than eight feet in height, and cut slopes less than four feet in height. Buttress fills, which are typically less than 20 feet high, and which do not support proposed dwellings, are allowed to have gradients of 2.5:1. All other engineered slopes in the project are to have gradients ranging from 3:1 to 3.5:1, depending on the slope height and nature of the material (bedrock or fill).	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(b) A slope stability analysis should be required in the design-level geotechnical report as the development potential of lands in the toe area of large landslides is unproven. This stability analysis is needed to support the assertion that buttresses are viable options for mitigation of potential movement near the toe of large, deep-seated landslides that extend into open space.	Yes
	(c) The approach to grading and development of the residential units should be to improve the stability of the open space lands by corrective grading of landslides, drainage improvements and revegetation of disturbed areas, in areas where development is adjacent to either steep slopes or hillsides which exhibit evidence of instability. Making cuts in the lower portion of a marginally stable hillside should be avoided.	Yes
	(d) A Geologic Hazards Abatement District (GHAD) or other entity (e.g., County Service Area or financing district) should be established. This will ensure efficient long-term abatement of geologic hazards, maintenance of drainage facilities and removal of sediment from debris catchment areas. The GHAD should be funded through property tax assessments, and governed by a plan of control.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(e) The Biological Resources section contains a mitigation measure which calls for unlined drainage channels in all wildlife corridors. It is important that the design of these channels, some of which run along the toe of slope, are designed so that they do not conflict with mitigation measure 4.2-6(c). The final design should incorporate the recommendations of the geotechnical engineer, and should be such that the maintenance requirements are kept to a practical minimum.	Yes
4.2-7 Potential vertical and lateral movement of fills could cause significant damage to improvements.	All of the following mitigation measures are required to reduce the impact from vertical and lateral movement of fills to a less-than-significant level.	
	(a) As recommended by the applicant's geotechnical consultant, selective grading should be used to construct major fills. Materials with the highest expansive potential should be placed at depth with materials of low to moderate expansion potential reserved for use in the upper portion of the fill.	Yes
	(b) Where placement of fill over compressible material is expected to cause an unacceptable amount of compression, the compressible material should be removed to a depth sufficient to mitigate fill settlement.	Yes
	(c) Where tolerance for lateral deformation of a fill is low, the applicant's geotechnical engineer should provide special design recommendations that are sensitive to specific site conditions (e.g., geometry of fill slope, composition of the fill, planned location of improvements and other factors). Reinforced earth has been successfully used to control problems of this type.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(d) Where the differential thickness of fill exceeds 10 feet, over-excavation methods should be used to create uniform foundation conditions. The over-excavation requirements should be provided in the design level geotechnical report.	Yes
	(e) For cut/fill transition lots, three feet of over-excavation should be used to make the transition more uniform as recommended by the Engeo report. This subject should be reviewed in the design level geotechnical report.	Yes
	(f) The design-level geotechnical report should include settlement analysis for each major fill. The report should also provide a specific analysis for differential vertical movement of building areas where fill thickness varies by more than 10 feet; for cut/fill transition lots; and provide analysis of lateral movement for lots at the edge of proposed fill slopes. It should also provide specific standards and criteria for selective grading of major fills.	Yes
	(g) The design-level report should provide a plan for long-term monitoring of settlement/swelling and lateral movement of major fills. The engineers for the project should establish monuments in fill areas, especially ravine fills. Monitoring is to commence with the completion of rough grading and continue throughout development of all lots in that phase of the project. Delay construction of residential lots on ravine fills until the final stages of a particular phase.	Yes
	(h) Fills should be limited to a maximum thickness of 75 feet, because the behavior of deeper fills is less well understood and, hence, less predictable.	Yes

	Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
4.2-8	The proposed project involves cuts and fills on moderately steep slopes, with a potential to cause significant erosion of unprotected slopes, and downslope sedimentation both on and off-site.	Since the proposed project would involve significant grading, mitigation measures are required for both: 1) construction-related, short-term erosion and sedimentation; and 2) long-term erosion and sedimentation. For construction-related, short-term impacts, one or more of the listed approaches would be selected by the project engineer as appropriate, on a site-specific basis within the project area. For long-term impacts, mitigation measures 4.2-8(d) through 4.2-8(g) are required.	
		(a) Grading activities should be restricted to the summer construction season (15 April through 15 October). Any earthwork done after 15 October should be limited to activities directly related to erosion control.	Yes
		(b) The applicant should provide an erosion control plan prior to approval of the grading plan. The following interim control measures should be employed based on site-specific needs in the project areas; • grading to minimize areas of exposed, erodible material, and to avoid over-concentration of rapidly flowing runoff in unprotected, erodible areas; • the erosion control plan should include water bars, temporary culverts and swales, mulch and jute netting blankets on exposed slopes, hydroseeding, silt fences, and sediment traps/basins; • placement of stripped topsoil on graded slopes prior to the onset of winter rains;	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	• because the biggest problem with effective sediment control is lack of maintenance, the erosion control plan must have a comprehensive program for inspection and maintenance during the winter rainy season, including provisions for documenting maintenance activities; • wherever feasible, isolate runoff from ungraded areas, thereby simplifying erosion control and sediment control measures within the graded area; • monitor the effectiveness of the erosion control measures throughout the duration of construction. Specifically, include a program to assess the effectiveness of erosion control measures by monitoring Tassajara Creek and the East Branch of Alamo Creek. For example, there is an existing commercial fish pond on Alamo Creek, downstream from the Tassajara project area. If access to this property could be secured, water quality sampling and monitoring of sedimentation rates would provide a basis for determining if the measures being implemented were adequate, or if the plan needed to be refined and improved.	
	(c) Where earthwork is proposed in the channel of Tassajara Creek or the East Branch of Alamo Creek, biotechnical slope stabilization measures should be employed (or integrated with engineered structures) to control erosion.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(d) In order to reduce the potential impacts of long-term erosion and sedimentation, the project should incorporate the appropriate design, construction and continued maintenance of one or more of the following long-term control measures. The specific measures should be based on the recommendations of the project geotechnical engineer and hydrologist. • Construction of sediment traps/basins and grassy swales at strategic locations to control sediment. • Revegetation and continued maintenance of graded slopes, either by a GHAD, homeowners association or maintenance district. Special care should be taken for slopes nearest creek channels. • Construction of drainage ditches or buttress fills above the developed area, and integration of the ditches with the existing and planned storm sewer systems. • Provide closed downspout collection systems for individual structures. • Design cut and fill slopes to minimize, as much as possible, the velocity of sheet flow runoff. • Provide periodic inspection and maintenance of both individual (lot) and common (project) erosion and sedimentation control facilities.	Yes
	(e) Project plans should incorporate drainage measures to collect and control surface runoff water on sloping lots, including lined ditches and closed downspout collection systems.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(f) Concentrated runoff should not be permitted to drain over cut or fill slopes.	Yes
	(g) The proposed location of lined drainage ditches should be specified on the development plan accompanying the design-level geotechnical investigation report, which should be reviewed by the County.	Yes
4.2-9 Expansive soils and/or bedrock have the potential to cause significant damage to foundations, slabs and pavements.	The following mitigation measures are required to reduce the impact of expansive soils and/or bedrock to a less-than-significant level.	
	(a) The design-level geotechnical investigation should provide criteria for foundation of pavement design developed in accordance with the Uniform Building Code (UBC) and County Code requirements on the basis of subsurface exploration and laboratory testing. The constraints on the use of expansive soil near finish grade should be evaluated in the design-level geotechnical investigation report.	Yes
	(b) Foundation design should include drilled-pier and grade-beam foundations, reinforced slabs and thicker pavement sections designed using criteria provided by the design-level geotechnical investigation.	Yes

Potentially Significant Impacts		Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
4.2-10	The proposed project would result in significant grading in unstable/marginally stable areas for domestic water reservoirs, pipelines, and variety of urban services needed to serve the community.	All of the following mitigation measures are required to reduce the infrastructure grading impacts to a less-than-significant level.	
		(a) The project proponents should design all potable water, wastewater and recycled water infrastructure to be located on undeveloped open space based on a grading plan and engineering geotechnical study prepared as part of the design level grading plan studies for the project. These plans should be prepared prior to processing the first tentative subdivision map for the project. The grading plan should be reviewed and approved by an engineering geologist acting on behalf of the County prior to the County's approval of the Development Plan for the affected property.	Yes
		(b) A design level geotechnical and geologic report should be prepared concurrent with the design level grading studies. This report should be subject to review and approval by an engineering geologist acting on behalf of the County.	Yes
		(c) Water reservoirs should be constructed on competent bedrock. The construction of reservoirs on highly weathered or sheared rock should be avoided. Construction of reservoirs astride a cut/fill transition should also be avoided.	Yes

Potentially Significant Impacts		Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
FLOOD HAZARDS/DRAINAGE/WATER QUALITY			
4.3-1	The development that is proposed for the project planning area would increase storm runoff in the Tassajara and East Branch watersheds. The result would be increases in peak flows and total volume of runoff that could aggravate the existing flooding problem in Alameda County.	All of the following mitigation measures are required to reduce the impact of increased runoff to a less-than-significant level.	
		(a) The applicant should construct a detention basin on Tassajara Creek to reduce post-development flows to predicted pre-development levels at the County line. The preliminary design of the basin should be based on results of a hydrology model run using the County Flood Control District's model. The hydrology analysis should include model runs for a family of storms (e.g., 3 hr., 6 hr., 12 hr., 24 hr., 36 hr.) to ensure that design parameters for the basin represent a worst-case scenario. The analysis should include a basin routing study and calculation of 100-year flows in the downstream channel. Points where 100-year flows should be calculated include: a) within the inadequate reach of channel between the Foley property and the Johnston Road bridge and b) the County line, and at intermediate points as needed.	Yes
		(b) Additional hydrologic analyses of the type specified above should be performed to confirm that the proposed basin site at the confluence of the east and west forks of the East Branch is capable of maintaining or reducing the existing peak flood flows on Alamo Creek at the County line. This analysis will necessarily involve routing flows through the proposed downstream detention basin in the Dougherty Valley project.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	The applicant should also evaluate the feasibility of participating in funding of the regional detention basins in the Dougherty Valley project in lieu of a project-specific basin. The hydrology analysis may also need to consider the scenario where the Dougherty Valley development and the downstream basin does not materialize or is significantly delayed in relation to the construction of Phase I of the TVPOA project. Based on the experience of the Contra Costa County Flood Control District, regional basins are more efficient to maintain and are preferable to smaller, project-specific facilities. As noted in the discussion commencing on page 4.3-31, the Flood Control District comments the East Branch detention basin should be constructed as an on-channel basin. Construction of an on-channel basin implies realignment of the lower-most reach of both the East and West Forks of the East Branch Creek. This could involve a possible secondary impact to the biologic resource value of the affected reaches of the channel. If the detention basin on the Wendt property is designed as a stand-alone, project-specific facility, the project proponent for the TVPOA shall reserve the Northeast Tributary Detention and Oak Knoll Detention sites for possible use as detention basins, subject to future review and approval by the Flood Control District.	

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(c) Based on the experience of the Contra Costa County Flood Control District, regional basins are more efficient to maintain and are preferable to smaller, project-specific facilities. If project-specific basins are proposed, a mechanism to assure perpetual maintenance is needed. A homeowners association would not be adequate for this purpose.	Yes
	(d) Detention basin design should involve coordination with Zone 7, Alameda County Flood Control District prior to final design.	Yes
	(e) Each detention basin should be oversized to ensure that the initial accumulation of sediment will not reduce the storage capacity of the basin below that required for the 100-year design storm. This is especially important for East Branch detention, because of its location with respect to development. (Suburban development may be highly sensitive to maintenance activities; over-sizing the basin would reduce the frequency of maintenance, and could allow post-development flows exiting the basin to be reduced below existing peak flows in the downstream channel.) This mitigation will create secondary impacts (refer to Section 4.3).	Yes
	(f) The Flood Control District would not be adverse to providing maintenance to the proposed Tassajara Creek Detention Basin provided that the following conditions are satisfied: • the basin is designed and constructed conforming to the District's standards and specifications;	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	• an adequate, perpetual, funding mechanism, such as a Benefit Assessment District, is in place to assure perpetual maintenance of the basin facilities; and • any planned dual use of the basin right-of-way is covered by a joint use agreement which should first be reviewed and approved by the Flood Control District. Conceivably the District would also be willing to provide maintenance for the East Branch basin provided its capacity, design and construction conformed with District standards. That necessarily implies that the basin is designed as an on-channel basin with a capacity of at least 15-acre feet.	
	(g) Detention basins must be developed concurrently with construction in the affected watersheds. They should be completed with the first phase of construction. Alternatively, construction of a detention basin may be phased, so that its volume is adequate to mitigate the runoff effects of graded and developed areas in the project.	Yes
	(h) The East Branch basin should be designed as an efficient sediment trap.	Yes
	(i) The Tassajara Creek basin site should provide surplus space (approximately two acres) for disposal of sediment removed from the basin during routine maintenance.	Yes

Table 2-1 *continued*

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(j) The design of detention basins should include features to avoid ponding stagnant water. The maintenance plan for each basin should include measures to control mosquito populations, dust and wildfire hazards.	Yes
	(k) The development in the northern portion of the project should not be allowed to increase peak flows through the inadequate portion of Tassajara Creek (i.e., reach between the Foley property and the Johnston Road bridge).	Yes
	(l) Because the Tassajara project will significantly increase the total volume of runoff in the post-development condition, detention basins should be over-sized to reduce peak flows below the existing peak flows at the County line.	Yes
4.3-2 Whether or not the detention basins are intended for recreational use, their proximity to residential development results in a potential safety hazard.	Minimum mitigation should include the provision of fencing and signing, specifically around both inlet and outflow structures, and designing of trash racks to prevent access to the outfall structures by children. Additional access restrictions that should be considered include: a) install four-foot high chainlink fences around the basins, even if they are improved as park or nature areas, b) equip fence gates with latching devices which cannot be readily operated by small children, c) provide hazard warning signs at gates, and d) keep gradients within basins at a slope of 4:1 (horizontal to vertical) or flatter. If a local park agency takes over responsibility for the proposed basins and/or the Tassajara and East Branch Creek channels for passive or active uses, (e.g., trails, recreation), fencing should be adapted to standards appropriate for the intended activities.	Yes

Potentially Significant Impacts		Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
4.3-3	High velocities of runoff during flood flows have the potential to cause significant erosion of creek banks, possibly resulting in damage to public and private property.	The following mitigation measures are required to reduce the impact of erosion hazard to a less-than-significant level.	
		(a) The hydrologic studies that are normally required with the final development plan should evaluate critical areas that are vulnerable to progressive erosion, and these studies should determine velocities. These studies should be done in combination with the final design of the detention basins. (The Flood Control District may provide hydrologic data or calculations, at a cost, to the applicant.) Depending on the amount of setback and proposed uses adjacent to the structural setback, aggressive measures may be needed to control erosion. Potential measures include drop structures to control stream gradient; or structural/biotechnical slope stabilization measures to control the rate of erosion. It should be recognized that structural or structural/biotechnical measures designed to slow velocities or control erosion may have secondary impacts on biotic resource values. The use of structural/biotechnical measures within the creek channel may affect the "n" value used to calculate the predicted peak flow increases at the County line, as discussed on page 4.3-31. This is another possible secondary impact.	Yes
		(b) A maintenance district should be formed to assume the responsibility for remediation of bank retreat problems that threaten improvements over the useful life of the project. The Geologic Hazard Abatement District recommended in Section 4.2 could be charged with this responsibility.	Yes

Potentially Significant Impacts		Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
4.3-4	Undersized culverts, bridge foundations and other in-channel obstructions could restrict flood flows, causing floodwaters to overtop creek banks in localized areas.	The following mitigation measures are required to reduce the impact of restricted flood flows to a less-than-significant level.	
		(a) Bridges should be sized to not constrict flows, particularly during peak runoff events. Design of bridges should be performed by a registered civil engineer.	Yes
		(b) Maps should be prepared showing the extent of the flooding downstream from the proposed detention basins upon completion of final design work for the basins. Those maps, along with supporting hydrologic data, should be provided to FEMA, along with a formal request for amendment of the Flood Insurance Rate Map.	Yes
4.3-5	Runoff from urbanized areas contains elevated levels of pollutants. These pollutants have the capacity to impact water quality in Tassajara and East Branch Creeks.	All of the following mitigation measures are required to reduce the impact of urban runoff to a less-than-significant level.	
		(a) All drain outlets should be constructed with energy dissipation structures, if needed, to prevent erosion.	Yes
		(b) Internal drainage facilities in neighborhoods should be sized to convey peak runoff from the 10-year storm, provided the volume in excess of design capacity does not result in inundation or ponding of water on private property. The size and design of water quality basins should be based on the acreage of their drainage area and the water quality objectives of the NPDES program.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(c) During the processing of tentative maps, the applicant should show the location and size of water quality basins and grassy swales. Hydrology data and preliminary design information for basins should be required at that time.	Yes
	(d) The conditions of approval for tentative maps should require a maintenance plan and a monitoring plan. An entity such as a Geologic Hazard Abatement District should have responsibility for maintenance of water quality basins and other private drainage facilities in the project.	Yes
	(e) The Biological Resources section contains mitigation measure 4.4-3(a) which calls for all wildlife corridors to contain unlined drainage channels. The design of these drainage facilities should complement the private drainage facilities and water quality basins in the project.	Yes
4.3-6 Implementation of the project would require extensive grading throughout lands proposed for development, resulting in an increase in site erosion.	An erosion control plan as described in Section 4.2, Impact 4.2-8 should be required with each grading permit application. Because buildout is expected to occur over a long time period (15 years or more), the erosion control plan should make provision for qualitative and quantitative monitoring of the effectiveness of the erosion and sediment control measures, especially parameters that examine a) success of revegetation, b) efficiency of sedimentation basins, and c) sediment load downstream from the graded area, in the channels of Tassajara and East Branch Creeks. Such monitoring would provide the opportunity to modify and refine the erosion control plan through time.	Yes

Table 2-1 *continued*

Potentially Significant Impacts		Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
4.3-7	Because project construction would require the use of gasoline- and diesel-powered heavy equipment, hazardous materials could spill on-site and wash into nearby drainages.	The County should require a hazardous substance control and emergency response plan as a condition of the grading permit. The plan (HSCP) should prescribe procedures aimed at reducing the potential for significant impacts on water quality caused by a chemical spill, require safe collection and disposal of hazardous substances generated during construction activities and include an emergency response program to ensure quick and safe cleanup of accidental spills. The plan should identify areas where refueling and vehicle maintenance activities are allowed. Any hazardous materials to be stored on-site are to be shown on a map accompanying this plan. Measures to control access, prevent spills and protect the materials overnight and on weekends must also be described.	Yes
4.3-8	Runoff from recycled-water irrigated areas has the potential to contribute to water quality degradation both within and downstream from the planning area.	If use of recycled water is included as a component of the project, storm runoff quality should be evaluated in terms of water quality objectives for the creeks and the standard set by regulatory agencies. Specific mitigation measures must await at least conceptual design for recycled-water irrigation systems.	Yes
4.3-9	Chemical use on golf courses and landscaping can adversely impact the quality of runoff and receiving waters.	All of the following mitigation measures should be implemented to maintain the quality of the water: (a) Identify the specific local resources and beneficial uses that might require protection and the pertinent policies, practices and regulations. Also evaluate specific constituents which might be delivered from chemical use to impacts resulting from that delivery. The results of this analysis would be standards and criteria for protection of water quality.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(b) Prepare a list of commercially available pesticides, rodenticides, insecticides, fungicides, and herbicides for use at this site based on their efficacy, toxicity, mobility and persistence as reported in the literature. Provide guidelines for the manner and means of applying these recommended pesticides, including controls or restrictions to be imposed on their use. These are based on the projected requirements of different portions of the golf course (tees, greens and fairways), field conditions at the time of application, the potential health impacts of each chemical to humans and wildlife, and the relative vulnerability to pesticide insult of the aquatic and terrestrial resources found in each subdrainage.	Yes
	(c) Develop criteria for fertilizers recommended for use based on their efficacy and susceptibility to leaching. Guidelines for fertilizer application should be provided.	Yes
	(d) Requirements for handling and storage of materials subject to regulations (siting criteria, not a hazardous materials management plan) should be outlined, including how the County and public will be notified of proposed changes in golf course operations.	Yes
	(e) General golf course and landscaping design criteria should be developed to promote protection of wetlands, and ground and surface waters from contamination carried in surface runoff.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(f) Golf course or landscaped area design criteria should be based on a consideration of site characteristics. The design should promote water conservation, reinforce chemical management recommendations, enhance protection of ground and surface waters from contamination by irrigation waters. It should also be consistent with any native plant restoration and revegetation efforts.	Yes
BIOLOGICAL RESOURCES		
4.4-1 A substantial acreage of non-native grassland plant community would be eliminated by grading and replaced by suburban development.	All of the following mitigation measures are required to reduce impacts on the grassland community to a less-than-significant level.	
	(a) Specific development plans within the project area must be reviewed and, as necessary, modified to comply with the Open Space and Natural Resource provisions of the final "Tassajara Design Guidelines," ensuring protection of sensitive biological resources, replacement and enhancement of wetlands and degraded habitat, and long-term management of open space areas.	Yes
	(b) The appendix to the proposed "Tassajara Design Guidelines" should be expanded to include a potential seed mix list of compatible grasses and forbs suitable for reseeding graded slopes throughout the project area. The list should include both native and common non-native perennial and annuals. Relative quantities of each species should be specified for application on a per acre basis.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(c) The Open Space Management and Maintenance provisions under Restoration and Management on page 100 of the proposed "Tassajara Design Guidelines" should be revised to include the following additional measures: • Vehicles and motorcycles must not be allowed to travel off designated roadways to minimize future disturbance to grassland cover and other vegetation, and unauthorized access to the surrounding undeveloped lands and open space. • Graded slopes in open space areas must be reseeded with a mixture of compatible native and non-native perennial and annual species to increase the diversity of the grassland cover. Highly invasive annuals typically used for erosion control alone should not be used. Suitable species and an appropriate seed mix for revegetation of graded slopes is listed in the Appendix of the "Tassajara Design Guidelines."	Yes
	(d) The measure regarding use of turf and ornamental species under Restoration and Management on page 100 of the proposed "Tassajara Design Guidelines" should be revised to read as follows: • Turf and ornamental landscapes should be restricted or prohibited in open space areas. Restrictions on unsuitable landscape species identified in the "Tassajara Design Guidelines" Appendix should be carefully reviewed and enforced. Cut and fill slopes should be revegetated with a mixture of compatible native and non-native perennial and annual species.	Yes

Table 2-1 *continued*

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(e) The measure regarding seeding of graded slopes under Erosion Control and Channel Stability on page 111 of the proposed "Tassajara Design Guidelines" should be revised to read as follows: • Revegetate graded slopes with a mixture of compatible native and non-native perennial and annual species. Highly invasive annuals typically used for erosion control alone should not be used. Suitable species and an appropriate seed mix for revegetation of graded slopes is listed in the "Tassajara Design Guidelines" Appendix.	Yes
4.4-2 Development as proposed would require removal of mature oaks and other native trees in areas of oak woodland, savanna and riparian forest communities.	All of the following mitigation measures are required to reduce impacts on sensitive natural communities and mature trees to a less-than-significant level.	
	(a) Consistent with recommendations in the proposed "Tassajara Design Guidelines," mature oaks and other native trees in the project area should be preserved and protected to the maximum extent possible. Specific development plans within the project area should be reviewed, and as necessary modified to ensure compliance with the tree protection and oak woodlands provisions in the final "Tassajara Design Guidelines."	Yes
	(b) The proposed Preliminary Development Plan, Grading Plan and other project plans should be revised as follows to preserve and protect mature native trees.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	• Eliminate a portion of the proposed Low Density Single-Family Residential area in Area G to preserve the fringe of the oak woodland on the northwest-facing slope east of Tassajara Creek. Grading and proposed development should be restricted to the east of the southeast-trending spur ridge that supports the woodland. • Refine anticipated grading in the proposed Low Density Single-Family Residential area in Area D to preserve individual trees on the north and east-facing slopes which could be removed to accommodate roadway access and ridgetop development in this location. • Relocate golf course improvements in Area B to provide greater protection of individual oaks below the proposed Club House, and the lower elevations of the major oak woodland in this location. Grading should be restricted away from individual trees and the fringe of the woodland.	
	(c) The Protection of Specimen Trees provisions on page 99 of the proposed "Tassajara Design Guidelines" should be revised to include the following additional measures: • Tree trunk locations should be accurately surveyed within 100 feet of proposed development areas, and trunk and canopy locations should be considered during preparation of specific development plans.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	• Proposed grading, roadway, creek crossings, drainage and lot improvements should be designed to minimize tree removal, and specific development plans modified accordingly. • Monitoring should be provided by a certified arborist during all phases of construction to ensure adverse impacts to trees to be retained are minimized and any necessary corrective measures are taken to repair possible damage. • An arborist should be retained for the supervision of any required trimming, clearance pruning, installation of protective fencing, mulching, root and trunk preservation, and incursions within root protection zones. (d) The Oak Intrusion Tree List in the Appendix to the proposed "Tassajara Design Guidelines" should encourage the use of native species. Holly oak, cork oak and southern live oak are not native to California and should be removed from the list, which is intended to provide suitable plantings where roadways pass by existing oak woodlands. The list should also be revised to apply to plantings along riparian forest, where roadways cross or parallel the edge of established oak and other tree cover along Tassajara Creek.	Yes
4.4-3 Wildlife habitat would be altered and fragmented, and wildlife use disrupted.	All of the following mitigation measures are required to reduce impacts on wildlife habitat to a less-than-significant level.	

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(a) The following revisions should be made to the proposed "Preliminary Development Plan" and associated plans to encourage wildlife movement along wildlife corridors through creation of natural drainages and protective cover: • Revise the grading and drainage plans to create natural, unlined drainage channels along all the proposed wildlife corridors across valley floors and lower elevations of the project area, and direct runoff from developed areas into the channels to provide a source of surface water in these features. These channels should be compatible with geotechnical considerations. • Prepare detailed restoration landscaping plans to provide for establishment of natural cover along the wildlife corridor drainages. Although irrigation may be necessary for the first few years to ensure establishment, vegetation in the drainages should eventually be self-sustaining without irrigation. • Design the wildlife corridor drainages to flow through the proposed wildlife undercrossings of major roadways. All wildlife undercrossings should be oriented perpendicular to the roadways to minimize their length. • Restrict landscaping to use of native species along the wildlife corridor drainages, creating native freshwater marsh and riparian scrub and forest cover along the new channels, bordered by a cover of non-native grassland and oak woodland/savanna plantings.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	• Implement landscape improvements along each new drainage during the initial phase of a specific development, allowing cover vegetation and wildlife use to become established before buildout of the surrounding area.	
	(b) Continuous north-south wildlife corridors should be provided from the undeveloped hills to the north of the project area to the Dougherty Valley to the southwest by improving the proposed wildlife corridors through Areas A, B, D, E, and L. The proposed Preliminary Development Plan should be revised as follows: • Preserve the link between Dougherty Valley and Alamo Creek through Area B by providing a wildlife corridor designation in the upland ridgeline area between the East Branch of Alamo Creek and the tributary stream through the proposed golf course along the western edge of the project area. This corridor should have a minimum width of 1,100 feet, which would require elimination of the triangular-shaped High Density Single-Family Residential area along the ridgecrest, and replacement of the area as Open Space. Elimination of the residential use in this location should serve to minimize the extent of required grading along the ridgecrest and serve to protect the three mature oaks which would otherwise be removed. • Maintain a functional wildlife movement corridor along the East Branch of Alamo Creek by restricting development a minimum of 50 feet from both sides of the channel bottom.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	• Continue the wildlife corridor designation along Tassajara Creek through Areas C and D as this corridor provides a crucial link across the valley floor and connection to strip corridors proposed in Areas I, J, K, and L. • Expand the link between Tassajara Creek and Dougherty Valley through the Areas L and E by increasing the proposed wildlife corridor to a minimum of 500 feet and limiting roadway crossings to Camino Tassajara and Country Loop Road. The proposed access to the Low Density Single-Family Residential area on the spur ridge to the south of the proposed corridor across Area L should be relocated to the south side of the spur ridge. This should also include relocation of the access to the High Density Single-Family Residential area along the west side Country Loop Road away from the wildlife corridor to the center of the residential use cluster.	
	(c) Continuous east-west wildlife corridors should be provided from the undeveloped hills to the east of the project area to the Dougherty Valley to the west by expanding the proposed wildlife corridors through Areas I, J, and K and extending wildlife corridors into other communities. The proposed Preliminary Development Plan should be revised as follows:	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	• Establish at least one major east-west wildlife corridor with a width of approximately one-quarter mile to provide a major link between the open space lands of Hidden Valley to the west and the undeveloped lands outside the urban limit line to the east. The preferred location of this major corridor should be coordinated with representatives of the USFWS and the CDFG to ensure that potential adverse impacts on special-status species such as San Joaquin kit fox are fully addressed, as recommended in mitigation measure 4.4-4(a). No new development or roadways should be permitted within the major corridor, and a wildlife undercrossing should be provided under Camino Tassajara as part of the corridor improvements. Lands within the corridor should be identified as open space or agricultural use with appropriate restrictions established to prohibit new residences, golf courses, or other development within the corridor. The preferred location of the major corridor appears to be through the center of Area J, along the alignment of the proposed southern terminus of Country Loop Road. Establishing the wildlife corridor at this location would require relocation of the end of Country Loop Road to the north into Area K, and elimination of most of the Medium Multiple Family Residential in Area J. The smaller proposed wildlife corridors between Areas K and J and Areas J and I would no longer be needed if the major corridor is established.	

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	• Extend a wildlife corridor into Area H (preferably the major east-west corridor) through construction of a wildlife undercrossing under Camino Tassajara at the seasonal drainage through the northern boundary of the open space on the east side of Camino Tassajara. The drainage should be enhanced with native plantings to provide protective cover between the hillside and the creek and to screen views of the developing valley floor from the sensitive golden eagle nest location. • Establish wildlife corridors along the tributary stream south of Highland Road and on the Brown property in Areas F and G, respectively. Corridors through these two locations should be a minimum of 400 feet in width, and the existing or relocated drainage should be restored with riparian scrub and forest cover. Proposed Medium Density Single-Family Residential use should be eliminated or relocated as necessary to accommodate the corridors through these two locations. • Define uses in the proposed open space area at the southern edge of Area L to include a new wildlife corridor drainage. Recreational uses such as the proposed Trail Staging Area indicated in the Parks & Open Space Diagram should be restricted to one side and a minimum of 50 feet from the channel through the corridor.	

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(d) Modifications should be made to the Alamo Creek culvert undercrossing of Camino Tassajara to improve the value of this potentially crucial movement corridor. These improvements should be made during the initial phase of project implementation given the significance of this corridor link, and all cost should be provided by TVPOA. These should include the following: • Physical improvements should at minimum include removal of the existing grate at the southern opening of the culvert and modifications to the interior of the culvert to provide a more gentle transition over the drop structure at the northern opening which precludes use by smaller mammals. • Interior changes could include construction of a series of small weirs within the culvert which gradually increase to the height of the drop structure, allowing for deposition of gravel/sediment on the bottom of the structure to create a more natural channel bottom. Any proposed changes to the interior of the culvert should be evaluated from a hydrologic standpoint to ensure that peak storm flows would still be accommodated. If necessary, the culvert should be replaced and increased in size to accommodate its dual function for drainage and as a wildlife movement corridor.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	• To the degree possible, improved access and protective cover should be provided around the fringe of the detention basin on the Blackhawk property to the north of the culvert to enhance the overall habitat value of the corridor. These improvements would be dependent on negotiations with representatives of Blackhawk, but preferably should include dense landscaping at the northern entrance to the culvert and creation of an upland passage along the eastern bank of the detention basin which extends to the culvert opening.	
	(e) The replacement tributary stream of Alamo Creek through the golf course in Area B should be relocated to the southern edge of the course, adjacent to the existing oak woodland. Restoring the stream at this location would serve to minimize disturbance by humans, avoid the need for long-term suppression of mature trees and shrubs which could otherwise interfere with play on the course, and greatly enhance the value of this feature as a movement corridor and eventually as riparian habitat. Features of the restoration plan include: • Restore and enhance the stream to provide well-developed freshwater marsh, and riparian scrub and forest cover. • Create ponds and pools with dense emergent freshwater marsh cover along the stream to provide replacement dispersal habitat and future breeding habitat for California red-legged frog.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(f) A replacement tributary stream should be provided between the enhanced pond habitat in the proposed West Community Park and Tassajara Creek in Area J to maintain and enhance the function of this stream as a dispersal corridor for California red-legged frog, western pond turtle, and other wildlife. The feasibility of relocating the stream corridor within the recommended wildlife corridor along the western edge of Country Loop Road should be explored. This may require adjustment to the proposed alignment of Country Loop Road to accommodate a stream channel between the roadway and hillside slope to the west. Adjustment of the roadway alignment would require eliminating a portion of the Medium Density Single-Family Residential designation along the eastern edge of the current roadway alignment. Alternatively, the relocated stream segment could pass through the Medium Density Single-Family Residential use area. This would require an open space corridor with a minimum width of 200 feet along the stream alignment and redesignation of this area as Open Space. Features of the restoration plan for the relocated stream segment should include: • Restore and enhance the stream segment to provide well-developed freshwater marsh, and riparian scrub and forest cover. • Create ponds and pool habitat with dense emergent freshwater marsh cover along the stream segment between the existing ponds and Tassajara Creek to provide replacement dispersal habitat and protective cover for California red-legged frog and western pond turtle.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(g) The Wildlife Corridors provisions listed on page 97 of the proposed "Tassajara Design Guidelines" should be revised to include the following additional measures: • Create seasonal drainages with unlined channel banks and bottoms along wildlife corridors through developed areas, providing natural movement corridors with dense protective cover and opportunities to minimize water quality degradation of Alamo and Tassajara creeks through natural filtration which would occur along drainage swales and channels. • Prepare and implement detailed restoration landscaping plans to provide for establishment of natural communities along the recommended drainages within the wildlife corridors through development. The plans should be restricted to use of native species, creating native freshwater marsh and riparian scrub and forest cover along the new wildlife drainages, bordered by a cover of non-native grassland and oak woodland/savanna plantings. Plans for landscape improvements along each new wildlife corridor drainages should be prepared and implemented during the initial phase of a specific development, allowing cover vegetation and wildlife use to become established before buildout of the surrounding area.	Yes
	(h) The Creek Crossings provisions listed on page 95 of the proposed "Tassajara Design Guidelines" should be revised to include the following additional measure:	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	• To the extent possible, design pedestrian and bicycle trails along creek corridors to cross roadways rather then pass under them at creek crossings and proposed wildlife undercrossings. Where traffic volumes warrant pedestrian crossings under the roadway, such as at the Tassajara Creek crossing, a separate pedestrian tunnel should be provided to separate human and wildlife movement. Fencing and dense landscape screening should be provided between the path and creek for a minimum of 100 feet on either side of the joint undercrossing to further separate human and wildlife movement under the roadway.	
4.4-4 Habitat for special-status taxa would be modified and eliminated.	All of the following mitigation measures are required to reduce impacts on special-status wildlife taxa of concern to a less-than-significant level. In addition, measures recommended above to mitigate potential impacts on wildlife resources would serve to partially reduce impacts on special-status wildlife taxa as well. (a) The project applicant should consult with the USFWS and CDFG, and comply with the provisions of the state and federal Endangered Species Acts. This may be achieved through preparation of a habitat plan which provides adequate, binding mitigation for potential impacts on California red-legged frog, San Joaquin kit fox, and other special-status species. The plan should require conduct of pre-construction surveys for denning and nesting locations of special-status animal species known or suspected to occur within the project area.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	The pre-construction surveys should comply with agency protocol, where established. With regard to San Joaquin kit fox, mitigation should at minimum include incorporation of a major east-west wildlife corridor across the floor of Tassajara Valley as recommended in mitigation measure 4.4-3(c), and adherence to the "Standardized Recommendations for Protection of San Joaquin Kit Fox." With regard to California red-legged frog, mitigation should at minimum include revisions to the proposed Habitat Preservation and Enhancement Plan, as recommended in mitigation measure 4.4-4(d).	
	(b) The Open Space and Natural Resources chapter of the proposed "Tassajara Design Guidelines" should be revised to include an additional section on Protection of Special-status Taxa, requiring pre-construction surveys. Species which should be addressed by preconstruction surveys include: known or possible additional future nest locations for golden eagle, black-shouldered kite, northern harrier, burrowing owl, red-tailed hawk and other raptors; known and possible additional future breeding and dispersal habitat for California red-legged frog and western pond turtle; possible future dens for San Joaquin kit fox and American badger; and potential roosting locations for pallid bat if large oak snags are to be removed by proposed development. This section should also: • Incorporate the habitat plan defined in consultation with the USFWS and CDFG, including revisions to the conceptual Habitat Preservation and Enhancement Plan for California red-legged frog and western pond turtle.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	• Identify the need for pre-construction surveys to document the presence or absence of essential nesting and den locations during future review of specific development plans. • Specify provisions to protect any additional sensitive resources if encountered. • Indicate that consultation with the CDFG and USFWS should be provided and appropriate mitigation required if sensitive resources are encountered during supplemental surveys, where required by state and federal law.	
	(c) The appendix to the proposed "Tassajara Design Guidelines" should be expanded to include an additional table addressing special-status taxa. The table should: • Identify each species of concern and instances where pre-construction surveys are necessary. • Characterize suspected essential habitat. • Specify appropriate setbacks or construction restrictions to minimize disturbance if sensitive resources are encountered.	Yes
	(d) The conceptual Habitat Preservation and Enhancement Plan for California red-legged frog and western pond turtle should be revised to: • Encompass known and potential breeding and dispersal habitat along the Alamo Creek drainage. • Provide for relocation where disturbance of existing habitat is unavoidable.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	• Include creation of pond and pool habitat at 200- to 400-foot intervals along major creeks and tributary drainages to serve as retreat habitat for dispersing individuals where feasible from a hydrologic/sedimentation standpoint. (e) The Protection of Golden Eagle Nest provisions on page 98 of the proposed "Tassajara Design Guidelines" should be revised to read as follows: • Major construction activities within one-half mile line-of-sight to the golden eagle nest should be restricted to the period outside the raptor breeding season (i.e., construction permitted from July 15 to January 15) to avoid possible abandonment of the nest from construction-related disturbance. Major construction activities include: grading; roadway, utility and landscape installation; and building foundation, framing, roofing and exterior treatment.	Yes
4.4-5 Existing wetland and other waters would be altered and partially eliminated.	The following mitigation measures would be necessary for compliance with requirements of jurisdictional agencies and to ensure that potential impacts on wetland resources are reduced to a less-than-significant level. (a) The general Natural Resource Protection provisions on page 92 of the proposed "Tassajara Design Guidelines" should be revised to include the following additional measure:	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	• All modifications to potential wetland and other waters, including filling of drainage swales, seasonal wetlands, creek crossings and flood control improvements, should be coordinated with representatives of the CDFG and Corps, as required by state and federal law, to ensure that any mitigation requirements and any design modifications are incorporated into the specific development plans during the initial stages of project review.	
	(b) The intermittent blue-line streams on the Brown property in Area G and Rapp-Tong/Cao properties in Area J should be retained or relocated as open channels and enhanced through riparian plantings with native trees and shrubs, providing a link between Tassajara Creek and uplands to the east and west of the valley floor.	Yes
TRAFFIC AND CIRCULATION		
4.5-1 The project would significantly affect traffic conditions on five of the twenty directional freeway segments.	The Tassajara project should contribute toward the cost of regional improvements as specified in the Tri-Valley Transportation Plan in proportion to its trip generation. The amount should be in accordance with the Tri-Valley Impact Fee, if enacted at the time of approval, or should be determined by County staff. The project is partially responsible for funding this measure.	Yes

Potentially Significant Impacts		Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
4.5-2	The Tassajara development would significantly affect queue operations on the westbound approach of the intersection at Camino Tassajara and Crow Canyon Road.	Extend the existing westbound left-turn pockets from 310 feet to 475 feet at the intersection of Camino Tassajara and Crow Canyon Road. This improvement would require cutting into the existing median, removing landscaping within the median, and paving over a distance of approximately 165 feet. The project is solely responsible for funding this measure.	Yes
4.5-3	The project would significantly affect level of service at nine of the 77 intersections studied.	Three alternative mitigation strategies for Impact 4.5-3 are presented below. Any one of the three mitigation packages would reduce the project impacts on intersection level of service to a less-than-significant level. The measures that are common to all three packages are indicated with an asterisk (*) next to their number. **Package A: Conventional Intersection Improvements** 4.5-3A-1 [Tassajara/Dublin] Implement any one of (a), (b), or (c) below. (a) Provide a triple eastbound left-turn lane, a triple westbound left-turn lane, and a free southbound right-turn lane at the intersection of Tassajara Road and Dublin Boulevard. (b) Upgrade the planned Gleason Drive from a four-lane residential arterial (30 mph speed, 800 vphpl capacity) to a four-lane urban arterial (40 mph speed, 900 vphpl capacity) from Tassajara Road west to Dublin Boulevard.	 Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(c) Provide a grade-separated interchange at the intersection of Tassajara Road and Dublin Boulevard. Any of (a), (b), or (c) could be integrated into plans for the area since all the land in the vicinity is currently vacant. The project is partially responsible for funding this measure.	
	4.5-3A-2* [Alcosta/Old Ranch] Convert the existing westbound shared through/right-turn lane to a right-turn-only lane at the intersection of Alcosta Boulevard and Old Ranch Road. This would require restriping the westbound shared through/right-turn lane. This can be accomplished within the existing curb-to-curb width. The project is solely responsible for funding this measure.	Yes
	4.5-3A-3* [Alcosta/Bollinger Canyon] Add a second westbound left-turn lane at the intersection of Alcosta Boulevard and Bollinger Canyon Road. This improvement could possibly be incorporated into the future six-lane design of Bollinger Canyon Road. The improvement could entail the acquisition of additional right-of-way. Implications of the improvement would depend on the extent to which the improvement could be accommodated within the Bollinger Canyon Road widening project. This proposed measure	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	needs to be supported with more detail before it can be considered viable. The additional detail cannot currently be provided because the future intersection layout, under the six-lane Bollinger Road plan, is currently unavailable. The project is partially responsible for funding this measure.	
	4.5-3A-4 [Dougherty/Dublin] Add a fourth southbound through lane at the intersection of Dougherty Road and Dublin Boulevard. This improvement could possibly be incorporated in the planned Dougherty Road widening project. Still, the improvement is likely to entail the acquisition of additional right-of-way. Other requirements of the improvement could include removing or relocating one or both corner service stations, removing and replacing curb and gutter and sidewalk, paving, removing landscaping, and relocating signal poles along southbound Dougherty Road on the near and far sides of the intersection. The project is solely responsible for funding this measure.	Yes
	4.5-3A-5* [Camino Tassajara/Windemere] Add a second northbound left-turn lane at the intersection of Camino Tassajara and Windemere Parkway. This could be integrated into plans for the area since all the land in the vicinity is currently vacant. The project is solely responsible for funding this measure.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	4.5-3A-6 [Crow Canyon/Camino Tassajara] Implement either (a) or (b) below.	
	a) Convert the eastbound exclusive right-turn lane into a free right-turn lane, convert the northbound shared through/right-turn lane into a through-only lane, and convert the northbound exclusive right-turn lane into a free right-turn lane at the intersection of Crow Canyon Road and Camino Tassajara. These improvements would require: 1) installing a pork-chop island on the southwest corner, 2) restriping the existing northbound shared through/right-turn lane, 3) installing a pork-chop island on the southeast corner, and 4) eliminating the shopping center access from eastbound Camino Tassajara at the first driveway on the far side of the intersection and possibly at the Tassajara Village Drive intersection (in order to allow adequate weaving distance for northbound free-right-turning vehicles and eastbound through vehicles).	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	b) Convert the eastbound exclusive right-turn lane into a free right-turn lane, convert the northbound shared through/right-turn lane into a through-only lane, and add a second northbound right-turn lane at the intersection of Crow Canyon Road and Camino Tassajara. These improvements would require: 1) installing a pork-chop island on the southwest corner, 2) restriping the existing northbound shared through/right-turn lane, 3) acquiring right-of-way, removing and replacing curb and gutter and sidewalk, paving, relocating the signal pole, and removing landscaping along northbound Crow Canyon Road on the near side of the intersection. The project is solely responsible for funding this measure.	Yes
	4.5-3A-7* [Hacienda/Dublin] Provide a separate signal phase for northbound right-turns at the intersection of Hacienda Drive and Dublin Boulevard. This could be integrated into plans for the intersection since the intersection is not yet upgraded to the ultimate 2010 design. The project is solely responsible for funding this measure.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	4.5-3A-8* [Camino Ramon/Bollinger] Convert the westbound shared through/right-turn lane into an exclusive right-turn lane at the intersection of Camino Ramon and Bollinger Canyon Road. This improvement would require restriping the westbound shared through/right-turn lane. The project is solely responsible for funding this measure.	Yes
	4.5-3A-9* [Sunset/Bollinger] Convert the southbound shared through/left-turn lane to an exclusive left-turn lane, convert the southbound inner right-turn lane into a shared through/left-turn lane, and convert the southbound outer (shoulder) right-turn lane into a free right-turn lane at the intersection of Sunset Drive and Bollinger Canyon Road. These improvements would require (1) reconstructing curb, gutter, and sidewalk, repaving and restriping on the southbound approach of Sunset on the near side of the intersection, (2) removing and reconstructing curb and gutter on westbound Bollinger Canyon Road at far side of intersection, (3) relocating signal pole and reconstructing pork-chop island at northwest corner of intersection, and (4) modifying traffic signal. The project is solely responsible for funding this measure.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	Package B: Reduced Project Development	
	4.5-3B-1 Reduce project development to 3,662 dwelling units, with subareas 1, 2, 3, and 4 comprising 846, 1,941, 776, and 99 units, respectively. The project is solely responsible for implementing this measure.	Yes
	4.5-3B-2 [Tassajara/Dublin] Implement any one of (a), (b), or (c) below.	
	(a) Provide a triple eastbound left-turn lane and a triple westbound left-turn lane at the intersection of Tassajara Road and Dublin Boulevard.	Yes
	(b) Upgrade the planned Gleason Drive from a four-lane residential arterial (30 mph speed, 800 vphpl capacity) to a four-lane urban arterial (40 mph speed, 900 vphpl capacity) from Tassajara Road west to Dublin Boulevard.	Yes
	(c) Provide a grade-separated interchange at the intersection of Tassajara Road and Dublin Boulevard.	Yes
	Any of (a), (b), or (c) could be integrated into plans for the area since all the land in the vicinity is currently vacant. The project is partially responsible for funding this measure.	

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	4.5-3B-3* [Alcosta/Old Ranch] Convert the existing westbound shared through/right-turn lane to a right-turn-only lane at the intersection of Alcosta Boulevard and Old Ranch Road. This would require restriping the westbound shared through/right-turn lane. This can be accomplished within the existing curb-to-curb width. The project is solely responsible for funding this measure.	Yes
	4.5-3B-4* [Alcosta/Bollinger Canyon] Add a second westbound left-turn lane at the intersection of Alcosta Boulevard and Bollinger Canyon Road. This improvement could possibly be incorporated into the future six-lane design of Bollinger Canyon Road. The improvement could entail the acquisition of additional right-of-way. Implications of the improvement would depend on the extent to which the improvement could be accommodated within the Bollinger Canyon Road widening project. This proposed measure needs to be supported with more detail before it can be considered viable. The additional detail cannot currently be provided because the future intersection layout, under the six-lane Bollinger Road plan, is currently unavailable. The project is partially responsible for funding this measure.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	4.5-3B-5 [Dougherty/Dublin] Implement either (a) or (b) below.	
	(a) Add a fourth southbound through lane at the intersection of Dougherty Road and Dublin Boulevard. This improvement could possibly be incorporated in the planned Dougherty Road widening project. Still, the improvement is likely to entail the acquisition of additional right-of-way. Other requirements of the improvement could include removing or relocating one or both corner service stations, removing and replacing curb and gutter and sidewalk, paving, removing landscaping, and relocating signal poles along southbound Dougherty Road on the near and far sides of the intersection.	Yes
	(b) Add a third westbound left-turn lane at the intersection of Dougherty Road and Dublin Boulevard. This improvement could possibly be incorporated in the planned Dublin Boulevard widening project. The improvement could entail acquiring additional right-of-way, removing and replacing curb and gutter and sidewalk, and paving westbound Dublin Boulevard on the near side of the intersection.	Yes
	The project is solely responsible for funding this measure.	

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	4.5-3B-6* [Camino Tassajara/Windemere] Add a second northbound left-turn lane at the intersection of Camino Tassajara and Windemere Parkway. This could be integrated into plans for the area since all the land in the vicinity is currently vacant. The project is solely responsible for funding this measure.	Yes
	4.5-3B-7* [Hacienda/Dublin] Provide a separate signal phase for northbound right-turns at the intersection of Hacienda Drive and Dublin Boulevard. This could be integrated into plans for the intersection since the intersection is not yet upgraded to the ultimate 2010 design. The project is solely responsible for funding this measure.	Yes
	4.5-3B-8* [Camino Ramon/Bollinger] Convert the westbound shared through/right-turn lane into an exclusive right-turn lane at the intersection of Camino Ramon and Bollinger Canyon Road. This improvement would require restriping the westbound shared through/right-turn lane. The project is solely responsible for funding this measure.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	4.5-3B-9* [Sunset/Bollinger] Convert the southbound shared through/left-turn lane to an exclusive left-turn lane, convert the southbound inner right-turn lane into a shared through/left-turn lane, and convert the southbound outer (shoulder) right-turn lane into a free right-turn lane at the intersection of Sunset Drive and Bollinger Canyon Road. These improvements would require (1) reconstructing curb, gutter, and sidewalk, repaving and restriping on the southbound approach of Sunset on the near side of the intersection, (2) removing and reconstructing curb and gutter on westbound Bollinger Canyon Road at far side of intersection, (3) relocating signal pole and reconstructing pork-chop island at northwest corner of intersection, and (4) modifying traffic signal. The project is solely responsible for funding this measure.	Yes
	Package C: Shadow Creek Drive South Extension	
	4.5-3C-1 Extend Shadow Creek Drive southward to connect to Bollinger Canyon Road in Dougherty Valley and extend Johnston Road westward to connect to the Shadow Creek Drive extension. The project is solely responsible for funding this measure.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	4.5-3C-2 [Tassajara/Dublin] Implement any one of (a), (b), or (c) below.	
	(a) Provide a triple eastbound left-turn lane, a triple westbound left-turn lane, and a free southbound right-turn lane at the intersection of Tassajara Road and Dublin Boulevard.	Yes
	(b) Upgrade the planned Gleason Drive from a four-lane residential arterial (30 mph speed, 800 vphpl capacity) to a four-lane urban arterial (40 mph speed, 900 vphpl capacity) from Tassajara Road west to Dublin Boulevard.	Yes
	(c) Provide a grade-separated interchange at the intersection of Tassajara Road and Dublin Boulevard.	Ywa
	Any of (a), (b), or (c) could be integrated into plans for the area since all the land in the vicinity is currently vacant. The project is partially responsible for funding this measure.	
	4.5-3C-3* [Alcosta/Old Ranch] Convert the existing westbound shared through/right-turn lane to a right-turn-only lane at the intersection of Alcosta Boulevard and Old Ranch Road. This would require restriping the westbound shared through/right-turn lane. This can be accomplished within the existing curb-to-curb width. The project is solely responsible for funding this measure.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	4.5-3C-4* [Alcosta/Bollinger Canyon] Add a second westbound left-turn lane at the intersection of Alcosta Boulevard and Bollinger Canyon Road. This improvement could possibly be incorporated into the future six-lane design of Bollinger Canyon Road. The improvement could entail the acquisition of additional right-of-way. Implications of the improvement would depend on the extent to which the improvement could be accommodated within the Bollinger Canyon Road widening project. This proposed measure needs to be supported with more detail before it can be considered viable. The additional detail cannot currently be provided because the future intersection layout, under the six-lane Bollinger Road plan, is currently unavailable. The project is partially responsible for funding this measure.	Yes
	4.5-3C-5 [Dougherty/Dublin] Add a fourth southbound through lane at the intersection of Dougherty Road and Dublin Boulevard. This improvement could possibly be incorporated in the planned Dougherty Road widening project. Still, the improvement is likely to entail the acquisition of additional right-of-way. Other requirements of the improvement could include removing or relocating one or both corner service stations, removing and replacing curb and gutter and sidewalk, paving, removing landscaping, and relocating signal poles along southbound Dougherty Road on the near and far sides of the intersection. The project is solely responsible for funding this measure.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	4.5-3C-6* [Camino Tassajara/Windemere] Add a second northbound left-turn lane at the intersection of Camino Tassajara and Windemere Parkway. This could be integrated into plans for the area since all the land in the vicinity is currently vacant. The project is solely responsible for funding this measure.	Yes
	4.5-3C-7* [Hacienda/Dublin] Provide a separate signal phase for northbound right-turns at the intersection of Hacienda Drive and Dublin Boulevard. This could be integrated into plans for the intersection since the intersection is not yet upgraded to the ultimate 2010 design. The project is solely responsible for funding this measure.	Yes
	4.5-3C-8* [Camino Ramon/Bollinger] Convert the westbound shared through/right-turn lane into an exclusive right-turn lane at the intersection of Camino Ramon and Bollinger Canyon Road. This improvement would require restriping the westbound shared through/right-turn lane. The project is solely responsible for funding this measure.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	4.5-3C-9* [Sunset/Bollinger] Convert the southbound shared through/left-turn lane to an exclusive left-turn lane, convert the southbound inner right-turn lane into a shared through/left-turn lane, and convert the southbound outer (shoulder) right-turn lane into a free right-turn lane at the intersection of Sunset Drive and Bollinger Canyon Road. These improvements would require (1) reconstructing curb, gutter, and sidewalk, repaving and restriping on the southbound approach of Sunset on the near side of the intersection, (2) removing and reconstructing curb and gutter on westbound Bollinger Canyon Road at far side of intersection, (3) relocating signal pole and reconstructing pork-chop island at northwest corner of intersection, and (4) modifying traffic signal. The project is solely responsible for funding this measure.	Yes
4.5-4 Projected volumes on Windemere Parkway through the project site exceed the capacity of the proposed roadway.	The site plan should be revised to provide four lanes on Windemere Parkway, consistent with the County General Plan. The project is solely responsible for implementing this measure.	Yes
4.5-5 Several cul-de-sacs and lanes may not meet County road requirements. This is a potentially significant impact.	Either of the following mitigation measures (a or b) would be required to reduce the impacts to a less-than-significant level. (a) The lanes and cul-de-sacs should be widened to the 32-foot County standard.	 Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(b) An exception from the County standard should be obtained from Public Works in order to permit 28-foot-wide lanes and cul-de-sacs. The project is solely responsible for implementing this measure.	Yes
4.5-6 Several cul-de-sacs within the development would exceed County length standards.	Either of the following mitigation measures (a or b) would be required to reduce the impacts to a less-than-significant level. (a) Alternative access should be provided for emergency vehicles to any parcels located more than 700 feet from a single access road. Any proposed alternative access would be subject to the review and approval of the Fire District. (b) The site plan should be revised and cul-de-sacs shortened. The project is solely responsible for implementing this measure.	 Yes Yes
4.5-7 Specific intersection controls could impact traffic delay and safety. This is a potentially significant impact.	The following mitigation measures are required to reduce the impact of insufficient intersection controls to a less-than-significant level. (a) A preliminary evaluation of intersection traffic controls for the major streets was completed based on projected traffic volumes. At a minimum, these controls shown on the figure should be installed. Intersection controls at other locations may also be needed, subject to further review of site plans at the subdivision map stage.	 Yes

Potentially Significant Impacts		Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
		(b) County staff should review detailed site plans when they become available and require appropriate intersection traffic controls. These should be the responsibility of the developer to install. The project is solely responsible for implementing this measure.	Yes
4.5-8	Close spacing of intersections may create sight distance problems for oncoming traffic. This is a potentially significant impact.	County staff should review detailed site plans when they become available to ensure that sight distances at the entrance roads are adequate for speeds on the roadways. Increased distances between intersections may be necessary. The project is solely responsible for implementing this measure.	Yes
4.5-9	Horizontal and vertical alignment may be too tight and/or have inadequate sight distance at several locations within the Tassajara development. This is a significant impact.	The following mitigation measures are required to reduce the impact of sight distance to a less-than-significant level. (a) The road system should be modified to eliminate the obvious locations with horizontal alignment problems as shown in Figure 4.5-17. (b) County staff should carefully review subsequent detailed site plans with regard to vertical sight distance and horizontal sight distance at intersections. If necessary, the plans should be modified to eliminate problem locations. The project is solely responsible for implementing this measure.	 (a) Yes (b) Yes

	Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
4.5-10	The design and location of driveways, median breaks, and curb radii can affect traffic congestion and safety. This is a potentially significant impact.	The streets should be designed in accordance with County standards. Some access should be maintained for existing parcels. Access to small-acreage parcels should not come directly from Camino Tassajara wherever possible. In locations where no other access is possible, access should be limited to right-turns-in and -out only. County staff should review subsequent detailed site plans to determine compliance with standards. The project is solely responsible for implementing this measure.	Yes
4.5-11	Geometric requirements at project intersections could necessitate acquisition of additional right-of-way. This is a potentially significant impact.	Right-of-way needs at project intersections should be evaluated to ensure that the project provides, at the time of project construction, sufficient right-of-way to accommodate the needed intersection lane geometrics. The project is solely responsible for implementing this measure.	Yes
4.5-12	On-street parking may be eliminated from some streets depending on residential need and topography. This is a potentially significant impact.	The following mitigation measures are required to reduce the impact of residential and commercial parking, sufficiency of truck loading areas and driveway/aisle widths to a less-than-significant level. (a) Parking should be provided in accordance with the County standards. The parking standard could be partially met with on-street parking if it is available. If the County parking standard cannot be met with on-street parking, then it must be met with off-street parking.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(b) Parking for the residential and nonresidential areas, such as businesses, schools, parks, etc., has not been detailed on the site plan. Sufficient parking needs to be provided to avoid impacts on residential areas. As subdivision plans are filed, future applicants will be required to meet County parking standards. The project is solely responsible for implementing this measure.	Yes
4.5-13 Insufficient parking in the commercial areas, or parking lots with inadequate design, could result in congestion or safety problems. This is a potentially significant impact.	All commercial buildings should be provided with adequate truck loading areas. County staff should review parking and loading area designs to ensure adequate space is available for truck maneuverability prior to subdivision approval. The project is solely responsible for implementing this measure.	Yes
4.5-14 Substantial portions of the development would be located more than one-quarter mile from a bus stop. This is a potentially significant impact.	All of the following mitigation measures are required to reduce the impact of insufficient transit facilities to a less-than-significant level. (a) The development plan/vesting tentative map shall include provisions for construction of a collector road system that provides efficient and convenient bus routing within one-quarter mile of 80 percent of the project households. Where feasible, cul-de-sacs that back up to the arterial or collectors shall have a pedestrian/bicycle path between the cul-de-sac and the road to allow convenient access to transit stops. Transit providers shall be consulted to ensure that the circulation plans will allow them to provide efficient service.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(b) Park-and-ride lots need to be provided at activity nodes along the main roads. The Tassajara Design Guidelines call for park-and-ride lots but their locations have not been specified. County staff should ensure that future site plans include park-and-ride lots in convenient and secure locations. The locations should be at the three activity nodes along Country Loop Road: the northern commercial area, the central commercial area, and the southern school/community center location. Each park-and-ride lot should accommodate 50 cars and should be provided with a transit shelter.	Yes
	(c) When subsequent site plans are prepared that detail the design and location of bus stops, County staff should share them with the transit agency (CCCTA) to get their input. Bus stops should be designed in accordance with CCCTA guidelines or the guidelines of any other transit provider that will serve this area. In addition, bus shelters should be provided at the park-and-ride lots and at the heart of the commercial and community centers. The project is solely responsible for implementing this measure.	Yes
4.5-15 Potential pedestrian/vehicle safety conflicts may occur on residential streets.	Provide sidewalks on all public residential streets, in conformance with County standards. The project is solely responsible for implementing this measure.	Yes

Potentially Significant Impacts		Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
4.5-16	Potential pedestrian/vehicle safety conflicts may occur near or at the school sites.	All of the following mitigation measures are required to reduce the impact of potential vehicle/pedestrian conflicts to a less-than-significant level.	
		(a) Crossing guards should be provided on Country Loop Road in front of the schools and also along Camino Tassajara at key crossing points.	Yes
		(b) Bus service should be provided for elementary and middle school students. This will help to reduce traffic congestion in and around the school sites.	Yes
		(c) When subdivision plans are submitted in the future, detailed circulation/access plans for each of the school sites within the project will be required. These plans should take into account adjacent and nearby uses (parks, commercial areas, etc.) and provide intersection and street configurations and driveway locations. Pick-up and drop-off at the school sites should also be considered in the plans. Signal warrants, off-street parking and intersection capacity near the school/park site should be analyzed. Cooperative planning with the School District is encouraged to minimize on-street parking and eliminate the need to provide wider roadway widths to accommodate large volumes of on-street parking near schools. Pick-up and drop-off access at the schools should be on a separate road from the bus loading and unloading where possible.	Yes
		The project is solely responsible for implementing this measure.	

Potentially Significant Impacts		Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
4.5-17	The project will generate an unfilled demand for transit service.	Bus service with one-half hour headways, at a minimum, should be provided to Bishop Ranch Business Park and the Dublin/Pleasanton BART station. Funding should be made available through CCCTA, another transit provider, or a Tri-Valley impact fee program. The project is solely responsible for implementing this measure.	Yes
		NOISE	
4.6-1	Proposed noise-sensitive land uses adjacent to major roadways in the project area would be exposed to traffic noise exceeding local guidelines.	All of the following mitigation measures are required to reduce the impact of traffic noise to a less-than-significant level.	
		(a) Special noise abatement measures and specifications in site planning and in the design of residential units and other noise sensitive structures exposed to high noise levels as discussed above should be implemented to achieve exterior L_{dn} of 60 dBA or less (low density) or 65 dBA (multi-family), and an interior noise level of 45 dBA or less.	Yes
		(b) Walls or earth berms, or a combination of the two, should be constructed along major roadways (i.e., Camino Tassajara Road, a portion of Windemere Parkway, Highland Road, Country Loop Road) to effectively reduce traffic noise at adjacent residential areas. The soundwalls would need to be constructed airtight and have a minimum surface weight of three pounds per square foot. Suitable construction materials would include masonry block, precast masonry or concrete panels, or wood if properly detailed. This mitigation will create secondary impacts (refer to Section 4.6).	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(c) Subsequent detailed noise assessments would be required for residential development exposed to an L_{dn} of 60 dBA or higher as required by County Planning Guidelines and Title 24, Part 2 of the California Administrative Code (for multi-family housing). These studies would be conducted on a project-by-project basis and would be done prior to the granting of a building permit. These detailed studies are beyond the scope of this report because they require final site and grading plans, and building plans.	Yes
4.6-2 Noise generated by proposed retail and commercial projects could expose existing and future noise sensitive receptors to excessive noise.	The following mitigation measures are required to reduce commercial generated noise impacts to a less-than-significant level.	
	(a) Retail and commercial projects proposed to be located adjacent to existing residential areas should not exceed the noise limits on the residential property boundaries as outlined below: • average hourly noise level of 55 dBA during daytime hours and 45 dBA during nighttime hours; or • if the ambient noise level already exceeds the above limits, project noise should not increase the ambient by more than 5 dBA, the minimum change required for any noticeable change in community response to occur.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(b) The County should require a design level acoustical assessment for future applications of commercial development that would be located adjacent to existing residential areas and have the potential to increase ambient noise levels.	Yes
4.6-3 Existing noise sensitive receptors along segments of Camino Tassajara would experience a substantial increase in traffic noise.	Mitigation measures for the existing residences along the segment of Camino Tassajara between Highland Road and Windemere Parkway, which would remain as development proceeds, include sound barriers to protect outdoor use areas facing the road. These barriers would need to be evaluated on a case-by-case basis in conjunction with the property owners to determine their feasibility and desirability at the individual properties. Options include masonry or concrete walls, wood fences, berms or some combination of these. This mitigation could create secondary impacts (refer to Section 4.6).	Yes
4.6-4 Significant short-term noise impacts on residential areas adjacent to construction sites would be expected during heavy periods of construction activity.	Project-related construction period noise impacts can be reduced to a less-than-significant level with implementation of the following conditions: • Limit noise generating construction activities, including truck traffic to and from the site to daytime hours (7:30 AM to 5:00 PM) during weekdays. • Properly muffle and maintain all construction equipment powered by internal combustion engines. • Prohibit unnecessary idling of internal combustion engines.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	• Locate all stationary noise generating construction equipment, such as air compressors and portable power generators, as far as practical from existing noise sensitive land uses. • Select "quiet" construction equipment whenever possible, such as air compressors with special housings and mufflers. All internal combustion engine driven equipment should be fitted with noise suppression devices, such as mufflers and engine enclosures, which provide noise attenuation equal to or greater than the manufacturer's original equipment. • Notify nearby residents of the construction schedule in writing. • Designate a noise disturbance coordinator responsible for responding to any local complaints regarding construction noise. This person should be responsible for developing and implementing a mitigation monitoring program. Post the name, title and telephone number of the noise disturbance coordinator conspicuously at the construction sites. Persons residing within 500 feet of construction activities should be notified.	
AIR QUALITY		
4.7-1 Construction activities would generate PM-10 and dust, creating the potential for nuisance.	All of the following mitigation measures are required to reduce construction-related impacts to a less-than-significant level.	

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(a) Minimum dust control standards should be established for all construction occurring within the project area. Conditions of approval should specify that the disturbed portions of the construction site would be watered twice per day to reduce dust emissions. On particularly windy days, the site would be watered more frequently, as needed. In addition, stockpiles of soil, sand, and other such materials would be covered when not being used; a 15 mile per hour speed limit would be enforced on unpaved surfaces; trucks hauling debris, construction materials or earth would be covered; and streets surrounding construction sites would be swept at least once daily. Contractors should be required to appoint a dust control monitor to oversee implementation of these measures.	Yes
	(b) Exposed areas would be seeded, treated with soil binders, or paved as soon as possible to minimize wind-blown dust generation.	Yes
	(c) Construction trucks should be prevented from idling longer than two minutes to the extent feasible.	Yes
	(d) Electrical rather than diesel or gasoline-powered equipment should be used where feasible.	Yes
	(e) All operational heavy equipment should be kept in good working order to reduce emissions and minimize the leakage of oils and fuels.	Yes
	(f) Use of dust suppressants should be required for locations where water quality is a concern. There are several commercially available dust suppressants with minimal water quality effects.	Yes

	Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
4.7-2	New emissions generated by the project would cause a deterioration in regional air quality. Project emissions would exceed the BAAQMD's significance criteria by a factor of five. ***This is a significant unavoidable impact.***	Although mitigation measures will not reduce the impact to a less-than-significant level, all of the following mitigation measures should be required to help reduce the level of impact.	
		(a) Section 4.5 of this report (Traffic and Circulation) identifies roadway improvements, intersection improvements and other transportation improvements designed to improve levels of service. These improvements would, in general, have a positive effect on emissions from automobiles by reducing vehicle delay.	No
		(b) The Tassajara Design Guidelines incorporate several features, described below, that can be used to promote alternative modes of travel, thereby reducing air quality impacts: • Transit stops located at Village Center commercial areas can provide a convenient interface for all transit modes. Provide transit information centers and appropriate shelters and other amenities. • Bikeways should be provided along major roadways and through open space areas to connect residences to the commercial centers. Commercial centers, transit stops and recreational facilities within the site should have adequate and secure bicycle parking areas. • Pedestrian paths should be provided connecting residences to commercial centers and recreation facilities.	No

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	• Provide a telecommuting center within the project to provide residents with the services of a large-scale business within walking or bicycling distance from their homes. • A Park-and-Ride opportunity should be provided within a two-mile drive of every residence. Park-and-Rides must be designed with adequate lighting and visibility. • Park-and-Ride facilities should have a place for autos or taxis to drop off passengers (Kiss-and-Ride) separate from the bus zone.	
	(c) The *Preliminary Development Plan* incorporates a variety of design strategies intended to reduce the need for vehicle trips, including: • Provide mixed-used Village Centers providing neighborhood commercial uses. • Provide on-site commercial, recreational, and employment-generating uses. • Cluster higher-density residential and other uses in proximity to the Village Center commercial core and transit centers.	No
	(d) The following measures should be incorporated into the project: • Restrict the number of fireplaces in residences, or require residential use of EPA-certified woodstoves, pellet stoves or fireplace inserts; or the use of natural gas-fired fireplaces should be encouraged.	No

Potentially Significant Impacts		Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
		• Require outdoor outlets at residences to allow use of electrical lawn and landscape maintenance equipment. • Make natural gas available in residential backyards to encourage use of natural gas-fired barbecues.	
VISUAL QUALITY/AESTHETICS			
4.8-1	Development of the Tassajara Valley planning area would alter the rural character presently viewed from area roadways, existing neighborhoods, proposed EBRPD trail and Mt. Diablo State Park parks. ***This is a significant unavoidable impact.***	The following mitigation measures would help to reduce the visual impact, but not to a less-than-significant level.	
		(a) Each application should be reviewed in the context of the Tassajara Design Guidelines to ensure that individual projects meet the intent of the overall vision described in the TVPOA application.	No
		(b) Roads, project entries, fencing, signage and other elements related to public roadways should conform to the Tassajara Design Guidelines.	No
4.8-2	Approximately 43 percent of the visually prominent open space would be developed if the project is implemented.	All of the following mitigation measures are required to reduce this visual impact to a less-than-significant level.	
		(a) The Conditions of Approval for the project's Preliminary Development Plan should incorporate language requiring subsequent development proposals to conform to the Tassajara Design Guidelines in order to ensure that new development is sensitively designed with respect to the site and adjacent construction.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(b) Mitigation measures recommended in the Geology/Seismicity/Soils and Biological Resources sections should be applied relative to cut of slopes and ridges, fill, wildlife corridors, habitat preservation and creek bank setbacks.	Yes
	(c) Public open space areas should be dedicated to a public agency or conservation organization to be conserved and managed in perpetuity.	Yes
4.8-3 The development would substantially alter the character of Camino Tassajara as a scenic route.	All of the following mitigation measures are required to reduce the scenic impact of altering a scenic route to a less-than-significant level.	
	(a) A minimum setback of 50 feet should be required between Camino Tassajara curbs and the road right-of-way edge. Landscaping and open fencing at open space and park areas should be allowed to encroach up to 30 feet into this setback to encourage the creation of edge variety.	Yes
	(b) The development intensity of the multi-family residential parcel (ML) located east of Camino Tassajara should be reduced to Single-Family Very Low (SV) to be consistent with other development located between Camino Tassajara and Tassajara Creek on the east side of Camino Tassajara.	Yes
	(c) Camino Tassajara sound walls at or near the 50-foot setback line should be limited to a maximum length of 400 feet in a single stretch and should be staggered to avoid the straight linear plane.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(d) The use of sound walls adjacent to roadways should be minimized as much as possible through the use of earth berms and site planning. Where required, sound walls should be substantially landscaped to soften their appearance.	Yes
	(e) Require a minimum 150-foot-wide landscaped open space area along the west side of Camino Tassajara at the project's southern boundary to create an entry to the County.	Yes
	(f) Relocate the roadway segment which currently is proposed as an extension of Johnston Road and preserve the existing hill at the western terminus of Johnston Road.	Yes
	(g) Maintain a substantial portion of the land along the south side of Camino Tassajara in its natural land form between Blackhawk Drive and Finley Road. Limit development next to the road to an area immediately adjacent to the Blackhawk Drive intersection.	Yes
4.8-4 The proposed grading would substantially alter the site's topography.	All of the following mitigation measures are required to reduce the impact of grading to a less-than-significant level.	
	(a) Grading and development should be prohibited on prominent hilltops as identified in Figure 4.8-26, other than that which is already constructed.	Yes
	(b) Refer to mitigation measure 4.8-3(f).	Yes
	(c) Refer to mitigation measure 4.8-3(g).	Yes
	(d) Future development plans must be consistent with the Tassajara Design Guidelines.	Yes

Potentially Significant Impacts		Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
4.8-5	Development along the Country Loop Road limits views to the natural open space and parks.	The following mitigation measures are required to reduce the impact of limited views to open space and parks to a less-than-significant level.	
		(a) Increase the Country Loop Road right-of-way to a minimum of 30 feet on each side of the roadway, and provide a Class I Bikeway along its length.	Yes
		(b) Provide additional open space and park breaks in the development along each side of the roadway between the Camino Tassajara/Blackhawk Drive intersection and the major open space corridor located between Johnston Road and Highland Road.	Yes
4.8-6	Secondary road layouts will create continuous rows of homes adjacent to Camino Tassajara and the Country Loop Road.	Redesign the secondary road layout to orient more cul-de-sacs to the edges of Camino Tassajara and the Country Loop Road. This would provide a greater varied building profile along the major street edges.	Yes
4.8-7	Recreational facilities may create visual impacts to residential development.	The following mitigation measures are required to reduce the impact of light and glare to a less-than-significant level.	
		(a) A Lighting Plan should be prepared for the sports park prior to the approval of Final Development Plans for the sports park and nearby residential areas. The plan should be prepared by a qualified lighting engineer acceptable to County staff and ensure the visual impacts of the lighting are minimized to staff's satisfaction.	Yes
		(b) The landscape plan for the sports park should include a tree screen between the sports park and nearby residential development.	Yes

Potentially Significant Impacts		Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
4.8-8	Water tanks serving the site would be easily seen from major roadways and other areas of the site.	All of the following mitigation measures are required to reduce the visual impact of water tanks to a less-than-significant level.	
		(a) Water tanks should be located away from visually prominent areas and integrated visually with residential development areas wherever possible, through the use of berming, landscaping and tank color.	Yes
		(b) Water tank design and specific landscaping guidelines in the Tassajara Design Guidelines should be expanded and augmented to include criteria and graphic examples of grading and landscaping techniques to ensure a natural blending of water tanks with the surrounding visual environment.	Yes
		(c) The following landscaping measures should be integrated into the Design Guidelines: • All graded areas should be revegetated with a planting mix similar to existing landscape. • A mix of 5-gallon and 15-gallon size, drought-tolerant native trees, such as bay, laurel, live oak, toyon, or buckeye, should be included in the landscaping plan. Trees and shrubs should be planted in clusters to reflect the natural vegetative conditions, rather than in a single line encircling the tank. Faster growing and taller trees should be placed upslope and closer to the tank. • Irrigation should be provided for a minimum of five years to achieve faster growth and optimize screening within the shortest possible time.	Yes

Potentially Significant Impacts		Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
		• Landscaping should be monitored for five years, and unhealthy trees should be replaced as soon as possible. (d) The precise location of water storage tanks and pump stations should be identified in the Final Development Plan. Siting should be consistent with Design Guidelines.	Yes
4.8-9	The major project entry at Highland Road would be compromised by the development patterns at its western terminus.	An open space or park terminus to Highland Road should be provided that is complementary to a backdrop of the natural open space on the hillside.	Yes
4.8-10	The integration of pad commercial development within largely residential development parcels in the Village Center (MU) areas may impact the visual quality and liveability of those residential areas.	The County should require the preparation of a Final Development Plan for each entire mixed use-designated area prior to the approval of any development plans for individual projects within these areas.	Yes
4.8-11	Residents exiting the Blackhawk east gate may have their views of the hills blocked by structures in the village center.	The following design measures should be implemented to reduce potential land use compatibility problems to a less-than-significant level: • Limit development in the northern village center to two stories in height; • Implement design guidelines relative to setbacks and architectural treatment; • Site commercial structures so front elevation faces Camino Tassajara and Blackhawk;	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	• Establish parking areas behind the buildings to reduce the number of street lights in view of Blackhawk; and • Use only downward pointed street lamps to avoid light trespass and glare.	
4.8-12 The Tassajara Design Guidelines as currently proposed may not adequately protect the visual environment of the project.	All of the following mitigation measures are required to reduce the impact of inadequacies in the Design Guidelines to a less-than-significant level.	
	(a) Development should be limited in the Village Centers to two stories in height with a third story allowed as a Conditional Use if integrated into a sloping roof structure or set back substantially from the building facades.	Yes
	(b) Any building element extending above the 50-foot basic height limit should be restricted to exclude useable floor space and the Tassajara Design Guidelines should be modified to address limitations in tower plan area, profile and bulk.	Yes
	(c) The Performance Standards should be rewritten to relate more closely to anticipated issues of land use, circulation, architectural and landscape development compatibility in the mixed-use Village Centers.	Yes
	(d) Development of the Village Centers should utilize joint parking resources to the maximum degree possible.	Yes
	(e) Reductions in parking requirements should be based upon joint utilization of parking resources and other factors and granted at the discretion of the Zoning Administrator.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(f) The provisions of Division 814-2 of the County Zoning Ordinance (SD-1 Slope Density and Hillside Development Combining District) should be applied to the project and the Tassajara Design Guidelines should be augmented to address development on slopes between 15 and 26 percent.	Yes
PUBLIC UTILITIES		
<u>Water</u>		
4.9-1 At buildout, the proposed project would create a demand for 2.55 mgd of potable water which DSRSD can provide only by developing a new water supply.	All of the following mitigation measures are required to reduce the impact of water demand on DSRSD to a less-than-significant level.	
	(a) Prior to approval of any final development plan, subdivision map, or conditional use permit, the applicant and DSRSD should certify that all approvals required to transfer water from BMWD have been obtained, planning for the infrastructure required to deliver and treat the water are well underway, and there is reasonable assurance that potable water can be supplied to meet the demands of the various phases of the proposed project by the dates the various phases are scheduled for implementation. DSRSD and/or Zone 7 will need to prepare an EIR to address the environmental impacts associated with the new water transmission and treatment facilities from the South Bay Aqueduct to the southern boundary of the project site. In addition, DSRSD and/or Zone 7 will have to assure that all property, rights-of-way, and/or easements can be obtained, and certify that a financing plan has been adopted.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(b) The Development Agreement should require individual applicants of future entitlements to obtain a "will serve" letter from DSRSD prior to approval of a final development plan for each phase of the project.	Yes
	(c) Applicants of future entitlements should comply with Section 916-2.002, Adequate Water Supply, of the Contra Costa County Subdivision Ordinance requiring the provision of an adequate water system.	Yes
	or,	
	(d) If sufficient water is not available to meet the water demand projections, the number of dwelling units should be reduced to reflect the available water supply prior to approving the Final Development Plan.	Yes
4.9-2 Delivery and treatment of a new water supply to serve the proposed project would require the construction of water transmission and treatment facilities by either DSRSD or Zone 7.	The County should require that applicants for future entitlements of the Tassajara development be responsible for contributing pro rata shares of the following costs:	Yes
	• Construction of a water treatment plant and connecting pipeline from the South Bay Aqueduct if DSRSD builds its own facilities to deliver and treat water for the proposed project	
	or,	
	• Construction of Zone 7 water treatment and delivery facilities required to serve the project if Zone 7 treats and delivers water to the proposed project	
	or,	

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	• Construction of new wells, connecting pipelines, and any wellhead treatment facilities if groundwater recharge and extraction is used to supply water for the proposed project.	
4.9-4 Excessive noise levels, visibility and power outages are potential problems which could occur with individual components of the potable water distribution system.	All of the following mitigation measures are required to reduce impacts to a less-than-significant level. (a) Include the following landscaping measures in the Design Guidelines: • Revegetate all graded areas with a planting mix similar to existing landscape. • Include a mix of 5-gallon and 15-gallon size, drought-tolerant native trees, such as bay, laurel, live oak, toyon, or buckeye, in the landscaping plan. Cluster trees and shrubs to reflect the natural vegetative conditions, rather than in a single line encircling the tank. Place faster growing and taller trees upslope and closer to the tank. • Provide irrigation for a minimum of five years to achieve faster growth and optimize screening within the shortest possible time. • Monitor landscaping for five years, and replace unhealthy trees as soon as possible.	Yes
	(b) Refer to mitigation measure 4.8-8(a).	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(c) The precise locations of domestic water storage tanks and pump stations should be identified on the Final Development Plan. The precise locations, site preparation, and landscaping should be consistent with the applicant's Design Guidelines and other zoning standards.	Yes
	(d) DSRSD should confirm that exterior noise levels outside pump stations would not exceed 60 dB at the pump station property lines.	Yes
4.9-5 Extending water service to the project site may be inconsistent with the *General Plan*.	The following mitigation measures are required to reduce the impact of *General Plan* inconsistency to a less-than-significant level.	
	(a) Refer to mitigation measure 4.9-1(a).	Yes
	(b) Prior to approval of the Final Development Plan, the applicant should revise the Public Facilities Implementation Plan to reflect the final plan for water supply facilities and the projected costs for providing the water supply needed to serve each phase of the project. The plan should further identify how the costs for providing water service will be divided between the applicant and property owners or developers of future projects in the area who will benefit from the new water supply.	Yes

	Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	Wastewater		
4.9-6	At buildout, the proposed project would generate approximately 1.23 mgd of wastewater during dry weather and a peak wastewater flow of approximately 5 mgd during wet weather.	The following mitigation measures are required to reduce the impact to a less-than-significant level.	
		(a) The applicants should comply with Section 916-4.002, Sewerage Requirements, of the Contra Costa County Subdivision Ordinance requiring the provision of sewage service to a subdivision by a public sanitation district or utility having adequate plant and facilities.	Yes
		(b) The County should require that applicants for future entitlements be responsible for contributing their pro rata share of the costs for facilities to properly collect, treat, and dispose of wastewater generated by the proposed project.	Yes
4.9-7	Insufficient capacity exists in the existing DSRSD sewer system to accommodate the proposed project and other future developments to be served with the system.	The following mitigation measures are required to reduce the impact to a less-than-significant level.	
		(a) Contra Costa County should continue to implement General Plan Policies 3-5, 3-7, 3-9, 7-31 and 7-33 and Implementation Measure 7-t to ensure development occurs in conjunction with the provision of adequate wastewater service.	Yes
		(b) The County's conditions of approval should include a requirement that applicants for future entitlements will be responsible for contributing pro rata shares of the costs to construct any new trunk sewers required for DSRSD to convey wastewater from the proposed project site to the DSRSD WWTP.	Yes

Potentially Significant Impacts		Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
4.9-8	Wastewater generated by the proposed project during the non-rainy periods of the winter months could not be exported out of the Tri-Valley through the existing LAVWMA export system.	In addition to mitigation measure (a), either (b) or (c) would be required to reduce the impact of wastewater export to a less-than-significant level.	
		(a) Contra Costa County should continue to implement General Plan Policies 3-5, 3-7, 3-9, 7-31 and 7-33 and Implementation Measure 7-t to ensure development occurs in conjunction with the provision of adequate wastewater service.	Yes
		(b) The County's conditions of approval should include a requirement that the applicants will be responsible for contributing pro rata shares of the costs for DSRSD to develop water recycling facilities including treatment processes and a groundwater injection and monitoring system to permit disposal of wintertime wastewater flows from the proposed project.	Yes
		or,	
		(c) The applicants should investigate on-site and off-site storage options to be used in conjunction with the "put-and-take" and/or demineralization and groundwater injection options described above to permit disposal of all wintertime wastewater from the proposed project in an environmentally acceptable manner. Additional environmental impact assessments will be required for the selected wintertime wastewater storage and/or disposal plan.	Yes

	Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
4.9-9	Wastewater generated by the project, combined with the cumulative flows from other potential developments within CCCSD service area, would exceed the existing capacity of CCCSD's facilities. Deficiencies would exist in the existing capacities of the Camino Tassajara, San Ramon, and A-line interceptors as well as the WWTP.	The following mitigation measures are required to reduce the impact to a less-than-significant level.	
		(a) Contra Costa County should continue to implement General Plan Policies 3-5, 3-7, 3-9, 7-31 and 7-33 and Implementation Measure 7-t to ensure development occurs in conjunction with the provision of adequate wastewater service.	Yes
		(b) If wastewater service is provided by CCCSD, the County should include a requirement that the applicants will be responsible for contributing their pro rata share of the costs for capacity-expansion projects for certain elements of CCCSD's wastewater collection, treatment, and disposal system.	Yes
4.9-10	New facilities would be required by DSRSD and capacities of some CCCSD facilities would be exceeded.	If wastewater service is collected by DSRSD and transported to CCCSD for treatment and disposal, the County should require that the applicants will be responsible for contributing their pro rata shares of the costs for new DSRSD facilities to collect and transport wastewater generated by the project, as well as capacity-expansion projects for certain elements of CCCSD's wastewater collection, treatment, and disposal system.	Yes
4.9-11	Wastewater treatment by both sanitary districts would create a demand on existing facilities.	If wastewater service is provided by both DSRSD and CCCSD, the County's conditions of approval should include a requirement that the applicants will be responsible for contributing pro rata shares of the costs for capacity-expansion projects for certain elements of both DSRSD's and CCCSD's wastewater collection, treatment, and disposal systems required to serve those portions of the proposed project that would be annexed to each district.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
4.9-12 Construction of an on-site satellite WWTP to serve the project could create land use conflicts.	All of the following mitigation measures are required to reduce the impact to a less-than-significant level. If a satellite WWTP is selected to serve the proposed project:	
	(a) The applicant should comply with Section 916-4.002, Sewerage Requirements, of the Contra Costa County Subdivision Ordinance and elements of the County General Plan.	Yes
	(b) The applicants for future developments should pay for the construction costs of a satellite WWTP and appurtenant pipelines, effluent injection wells, etc.	Yes
	(c) TVPOA should annex to or contract with the DSRSD or CCCSD to provide operation and maintenance services for a satellite WWTP as a condition of Final Development Plan or subdivision map approval.	Yes
	(d) The development standards should include the following criteria for constructing a satellite WWTP:	Yes
	• All necessary approvals and permits, including a NPDES permit, to build and operate the satellite WWTP should be obtained. Sludge should be discharged through a sewer or dedicated pipeline to the DSRSD or the CCCSD WWTP.	

Table 2-1 *continued*

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	• A qualified, registered civil/sanitary engineer should design the satellite WWTP to reliably and consistently achieve waste discharge requirements imposed by the RWQCB. Consistent with achieving waste discharge requirements, the WWTP should be designed to minimize the consumption of energy and chemicals, the generation of odors, and the presence of noise. Sodium hypochlorite should be used for disinfection (unless a better process or chemical is developed in the future). • An architect should be retained to provide attractive architectural designs, features, and landscaping at the satellite WWTP.	
4.9-13 Providing wastewater and reclaimed water services to the Tassajara Valley project may be inconsistent with the *General Plan.*	The following mitigation measures are required to reduce the impact to a less-than-significant level.	
	(a) The applicant and DSRSD or CCCSD should demonstrate to the County that adequate wastewater treatment capacity can be provided through buildout prior to approval of the Preliminary Development Plan.	Yes
	(b) The applicant should revise the Public Facilities Implementation Plan to include the total costs for wastewater collection, treatment and disposal, as well as the recycled water supply, prior to approval of the Preliminary Development Plan.	Yes

Potentially Significant Impacts		Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	Recycled Water		
4.9-15	Irrigation with recycled water creates a limited health risk if humans inadvertently digest the water.	The development standards should include a requirement that the applicant install and operate a recycled water distribution system in a manner which will minimize potential public contact with recycled water. The following practices should be implemented in the recycled water distribution system: • Install automatic irrigation systems to restrict irrigation to the early morning hours when few people are outside. • Post signs in areas of recycled water use warning people not to drink or come in contact with the recycled water. • Grade areas irrigated with recycled water to eliminate runoff in dry weather. • Prohibit use of recycled water at private residences and other areas which are not professionally managed where people might inadvertently drink the water from a garden hose or otherwise come in close contact with the recycled water. • Provide recycled water irrigation system features or operational restrictions required by the Contra Costa County Department of Public Health Services.	Yes
4.9-16	Installation of the recycled water distribution facilities may create excessive noise and visibility problems for residents of the proposed project.	All of the following mitigation measures are required to reduce the impact to a less-than-significant level.	

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(a) Placement of recycled water storage tanks should follow the techniques detailed in the applicant's Design Guidelines. The following mitigation measures should be added to those listed in the Design Guidelines: • Tanks should be located in ravines or on the back sides of hills to reduce direct visibility from both on and off the project site. Grading for the tank pad and service road should be rounded to simulate a rolling hillside. • Tanks should be painted in a color that blends with the natural hillsides in summer. • All graded areas should be revegetated with a planting mix similar to existing landscape. • A mix of 5-gallon and 15-gallon size, drought-tolerant native trees, such as bay, laurel, live oak, toyon, or buckeye, should be included in the landscaping plan. Trees and shrubs should be planted in clusters to reflect the natural vegetative conditions, rather than in a single line encircling the tank. Faster growing and taller trees should be placed upslope and closer to the tank. • Irrigation should be provided for a minimum of five years to achieve faster growth and optimize screening within the shortest possible time. • Landscaping should be monitored for five years, and unhealthy trees should be replaced as soon as possible.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(b) Refer to mitigation measure 4.8-8(a).	Yes
	(c) The precise locations of recycled water storage tanks and pump stations should be identified on the Final Development Plan. The precise locations, site preparation, and landscaping should be consistent with the applicant's Design Guidelines and other zoning standards.	Yes
	(d) Adequate noise attenuation features should be included in the design of the pump stations to reduce noise levels to 60 dB outside the pump stations.	Yes
	PUBLIC SERVICES	
Law Enforcement		
4.10-1 The proposed Tassajara development would require additional law enforcement officers, equipment and facilities.	All of the following mitigation measures are required to reduce the impact of increased demand for law enforcement services to a less than significant level and to bring the project into conformance with the standards of the General Plan.	
	(a) The County should condition approval of the project on an adequate funding mechanism to provide a total of 14.5 law enforcement officers, four patrol cars and a substation encompassing 2,245 square feet upon buildout. The supplemental funding mechanism would augment existing General Fund revenues and ensure that the development receives adequate law enforcement services as called for in the General Plan standards.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(b) If supplemental funding proves necessary, the County and project proponent should identify the funding mechanism which could include either annexation to existing Police Service District P-6 or, the formation of a new police services district. Whichever funding mechanism is put into place, consideration should be given to assuming traffic-related services from the CHP since they are unable to adequately patrol the area. Such a provision would ensure compliance with Goal 7-V of the General Plan.	Yes
	(c) Incremental hiring of law enforcement personnel will be required as development occurs in the Tassajara Valley. This incremental hiring and purchase of equipment should be tied to the applicant's phasing plan. The Sheriff's Department should provide a hiring schedule to the Community Development Department which will be included in the monitoring program.	Yes
	(d) The applicant's capital improvement plan should identify the development's fair share of the cost to construct a sheriff's substation in Tassajara Valley. The plan would identify when fees should be paid.	Yes
	(e) The applicant's capital improvement plan should identify the development's fair share of the cost to purchase five patrol vehicles. The plan would identify when fees should be paid.	Yes
	(f) The Design Guidelines should incorporate crime prevention measures, such as defensible space standards (including "defensible" landscaping recommendations), criteria for displaying house numbers that would be visible from the street, and lighting and landscaping of open space areas.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(g) Final development plans of subsequent projects should be reviewed by the Sheriff's Department to ensure appropriate crime prevention measures have been included and the roadway design is adequate.	Yes
<u>Fire Protection</u> 4.10-2 Implementation of the Tassajara development area would increase the need for fire protection service.	The following mitigation measures are required to reduce the impact of an increase demand in fire protection service to a less-than-significant level.	
	(a) The applicant's capital improvement plan should identify the development's fair share of the cost to replace the existing fire station. The plan should also identify when this improvement will be completed.	Yes
	(b) The capital improvement plan should contain language directing future applicant's to participate in funding a fair share of new equipment. The type and number of pieces of equipment required would be coordinated with the San Ramon Valley Fire Protection District.	Yes
4.10-3 Development of the site would increase the potential risk for wildland fires.	All of the following mitigation measures are required to reduce the impact of the potential risk for wildland fire to a less than significant level.	
	(a) All houses should have fire retardant roofs.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	(b) A 100-foot-wide buffer should be incorporated behind all structures which back up to open space/wildland areas. This buffer may include: fire/drought resistant vegetation and/or mowing and disking of wild vegetation. Criteria should be developed in conjunction with SRVFPD Fuel Modification Standards and incorporated into the Planned Unit Development Plan and Design Guidelines and should be coordinated with the biological mitigation measures as identified on Figure 4.4-4. This mitigation would create a secondary impact (refer to Section 4.10).	Yes
	(c) The SRVFPD should review and approve the criteria contained in the applicant's Design Guidelines (November 1995) prior to finalizing the design guidelines and preliminary development plan.	Yes
	(d) As a condition of project approval, the County should require the applicant to provide a wildland fire management plan as discussed in the PUD Plan. The plan should be reviewed and approved by the SRVFPD.	Yes
	(e) All effort should be made to restrict building houses in swales or cantilevered out over the slope. However, if this is not achievable, extra fire prevention measures should be required, such as the use of fire retardant landscaping.	Yes

	Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	Parks and Recreation		
4.10-5	During the first phase of development the project would not meet community park/recreation standards. This could overburden the three proposed neighborhood parks and impact area facilities, particularly in the Town of Danville.	To reduce this impact to a less than significant level, the applicant would be required to develop a minimum of 12 acres for a community park within Phase 1. Implementation of mitigation measure (b) would only partially reduce the impact.	
		(a) A minimum of 12 acres should be provided for a community park in the first phase of development. This can be done by either prematurely developing the sports park that is slated for development in Phase 2, or relocating the sports park to a site within Phase 1.	Yes
		or,	
		(b) Temporary lighting could be provided at the Finley Park site to allow evening use. Since this park is the largest within Phase 1, it would be appropriate to temporarily light the playing fields and tennis courts. This mitigation would help to reduce the day-time burden but would only partially mitigate the impact. Additional acreage would still need to be provided to meet the community park standard.	No
4.10-6	Costs to construct and maintain the parks/recreational facilities, trails and open space areas have not been finalized.	The question of ownership and maintenance of public parks and open space should be resolved prior to approving the final development plan. If EBRPD is the responsible agency, a funding mechanisms for park/open space maintenance should be in place prior to final development approval.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
Schools		
4.10-7 Implementation of the development plan would require two additional elementary schools, one additional middle school and a portion of a new high school to accommodate students generated by the development.	All of the following mitigation measures are required to reduce the impact on the school district to a less-than-significant impact.	
	(a) The Capital Improvement Plan should include language requiring developers of the Tassajara project to finance the construction of the three schools. Size of facilities and timing of construction should be coordinated with the District and defined in the CIP or school agreement. Yes	Yes
	(b) Development fees determined by the County and the School District should be assessed individual development proposals to offset the cost of the new high school in Dougherty Valley. The initial size of the school will need to be expanded to accommodate the Tassajara Valley students.	Yes
	(c) School sites designated on the preliminary development plan should be approved by the school district prior to plan approval.	Yes
	(d) Future development approvals should be conditioned on the availability of adequate school facilities.	Yes
	(e) An annual review of student generation and facilities capacity should be conducted. During project construction the Community Development Department, project proponent and SRVUSD should meet annually to review and monitor the number of students being	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	generated by the project, the progress of schools under construction, and the number of building permits issued, in order to determine the necessity for implementation of the above mitigation measures.	
<u>Childcare</u> 4.10-9 The Tassajara development would create a substantial demand for childcare facilities for pre-school and middle-school age children.	The following mitigation measures are required to reduce the impact to a less-than-significant level. (a) The Design Guidelines should be revised to incorporate language identifying appropriate locations for childcare facilities. (b) Applicants of future entitlements must comply with ordinance provisions (County Code, Chapter 82-22) to assure facilities in the area.	 Yes Yes
CULTURAL RESOURCES		
4.11-1 The project could result in the loss of a potentially important historic archeological site.	The following mitigation measures are required to reduce the impact to a less-than-significant level. (a) Limited subsurface testing should be conducted at the historic archeological site discovered within the Tassajara Valley project area to determine the extent of buried cultural deposits, if any, and importance of each site. Should this site be found to exhibit surface or near-surface components only, the recording of the site and results of limited subsurface testing should serve as adequate mitigation to permit loss of the resource.	 Yes

Table 2-1 *continued*

Potentially Significant Impacts		Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
		(b) Should a site be found to contain subsurface deposits or features that are of a complexity or extent that cannot be characterized sufficiently through limited subsurface testing, it is recommended that either (1) the site be avoided and dedicated as open space with assurances that the cultural component is preserved; or (2) a program of data recovery be designed to gather enough data to permit loss of the resource, as described in the CEQA Appendix K Guidelines.	Yes
4.11-2	Previously undiscovered historic or prehistoric archeological sites or features could be encountered during project-related construction activities.	To avoid significant impact to previously undiscovered cultural resources that might be encountered during construction, the project sponsor should (1) contract the on-call services of both a qualified professional (historic and prehistoric) archeologist (one meeting the criteria of the Society of Professional Archaeologists), as well as an Ohlone or Miwok Native American observer, (2) stop work in the immediate area of the find, secure the area and contact the archeologist, and (3) instruct construction personnel on the project as to both the potential for discovery of cultural or human remains, and the need for proper and timely reporting of such finds, and the consequences of failure thereof.	Yes
4.11-3	The proposed project may disturb unknown archaeological or cultural sites located on unsurveyed portions of the project site.	Cultural resource surveys will be conducted for all portions of the TVPOA project site prior to approval of Final Development Plans on the unsurveyed areas being considered.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
JOBS/POPULATION/HOUSING		
4.12-6 The project would increase the over-supply of units priced at the middle and upper income ranges, beyond expected demand for the Tri-Valley region as a whole, by more than 5,300 units and would increase the deficit of housing needed for lower-income households generated by project area employment by about 150 units.	All of the following mitigation measures are required to reduce the impact of housing affordability to a less-than-significant level.	
	(a) The applicant should be required to provide a minimum of 25% of the units affordable to low- and moderate-income households, with a minimum of 10% reserved for very low-income households, a minimum of 25% for low-income households, and a maximum of 65% for moderate-income households.	Yes
	(b) In order to achieve the above requirements, the following measures should be incorporated into the applicant's development plans: • The County should consider requiring the project to include higher density housing (20 to 30 dwelling units per acre), including some rental housing and some senior housing, in proximity to arterial roads and shopping areas. • The project Design Guidelines should be revised to show how higher density (20 to 30 dwelling units per acre) moderately priced housing, including rental housing, and including housing for seniors and for disabled persons, may be incorporated into the project. • The project development agreements should ensure that units initially made available to lower-income households remain in that price range for twenty years for ownership housing and for thirty years for rental housing.	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	• The applicant should work with the County to develop appropriate financing mechanisms and non-financial assistance measures that would reduce the cost of development for very-low- and low-income housing.	
	(c) To enable the County to ensure that the project meets its affordable housing goals and does not exceed approved overall densities, the PUD plan should be revised to delete provision for secondary units as an option for affordable housing.	Yes
4.12-7 If project implementation follows the proposed phasing plan presented by the applicant, it would contain an adequate supply of housing affordable to moderate-income households in all phases, but no housing affordable to very-low- or low-income households in any phase.	The following mitigation measures are required to reduce the impact of an inadequate supply of affordable housing to a less-than-significant level.	
	(a) The applicant should be required to provide a minimum of 25% of the units in each phase of development affordable to low- and moderate-income households, with a minimum of 10% reserved for very low-income households, a minimum of 25% for low-income households, and a maximum of 65% for moderate-income households. Yes	Yes
	(b) In order to achieve the above requirement, the following measures should be incorporated into the applicant's development plans:	Yes

Potentially Significant Impacts	Suggested Mitigation Measures	Does mitigation reduce impact to a less-than-significant level?
	• At each stage of project implementation, appropriate provision should be made to ensure that sufficient housing affordable to very-low-income, low-income and moderate-income households is included. The affordable units should be dispersed throughout the project and consist of a variety of housing types, including apartments, second units, etc. • As each phase develops, the applicant should ensure that the required minimum number and percentage of dwellings affordable to very-low income, low-income and moderate income households are either occupied or available for rent or for sale in Tassajara Valley.	
4.12-8 The project's lack of affordable housing for lower income workers will generate additional commuting, which would be an indirect transportation impact.	The following mitigation measures are required to reduce the impact of additional commuting to a less-than-significant level.	
	(a) The applicant should work with the County to develop trip-reduction and mass transit strategies that would reduce the impact of commuting by all on-site residents and workers. This may include development of a Traffic Management Plan involving periodic survey and monitoring of local employers.	Yes
	(b) Higher density units should be clustered around transit sites and commercial uses within the project site.	Yes

3.0 PROJECT DESCRIPTION

3.0 PROJECT DESCRIPTION

PROJECT LOCATION

The proposed Tassajara development site is located in an unincorporated area of south-central Contra Costa County, known as the Tassajara Valley. The northern boundary of the project site is located adjacent to the southern edge of Danville town limits and two miles east of the San Ramon city limits via local roadways. The project lies on either side of Camino Tassajara and the Alameda County line forms the southern boundary of the site. (See Figure 3-1, Regional Setting and Project Location.)

Tassajara Valley is part of the subregional planning area known as the Tri-Valley, consisting of the San Ramon, Amador and Livermore Valleys, and encompassing major growth areas of south central Contra Costa and eastern Alameda Counties. The Tri-Valley area includes the incorporated communities of Danville and San Ramon, the unincorporated communities of Alamo and Blackhawk in Contra Costa County, and the cities of Livermore, Pleasanton and Dublin in Alameda County. The Tri-Valley also includes the Dougherty Valley planning area, located immediately west of the Tassajara project site.

Major highway access is provided by Interstates 680 and 580 via Sycamore Valley Road, which becomes Camino Tassajara in the Town of Danville, northwest of the site and Crow Canyon Road in San Ramon. Tassajara Road connects to Interstate 580, south of the site.

The Tassajara project area is bounded on the east by rural ranch lands beyond the County's Urban Limit Line and on the west by the undeveloped Dougherty Valley planning area. To the north is the unincorporated community of Blackhawk and to the south, just beyond the County line, is the City of Dublin Sphere of Influence (see Figure 3-1).

PROJECT SITE

The project site straddles Camino Tassajara, extending from a point 1,600 feet east of Lawrence Road in the Town of Danville to the Contra Costa/Alameda County line in the south. The general topography consists of two valleys, the Sycamore Valley running east to west, and the Tassajara Valley running north to south, connected by Camino Tassajara which passes from one to the other. The hills that border these valleys rise to 900 to 1,000 feet above sea level, or about 300 feet above the valley floor. Tassajara and Alamo Creeks pass through the project area. Tassajara Creek generally follows the north-south Tassajara Valley floor, and Alamo Creek cuts across the northwest corner of the site. (See Figure 3-2.)

The Tassajara Valley is mainly in agricultural use, such as spring pasture and livestock grazing, with a few orchards, small horse ranches and 5-acre ranchettes. Residential development is limited to approximately 120 rural residential units, most of which are clustered along Camino Tassajara, Bruce

Drive, Finley Road, Johnston Road and Highland Road. Development has been primarily contained to the valley floor.

The Tassajara planning area consists of 4,491 acres. Land ownership is divided between larger owners who have traditionally had the land in agricultural use and small-parcel rural homeowners.

The current *General Plan* land use designation for the entire Tassajara planning area is AL (Agricultural Lands). The valley is also zoned for agricultural use including A-2 (General Agriculture), A-3 (Heavy Agriculture) and A-20, A-40 and A-80 (Exclusive Agriculture). More than half the project area—2,677 acres—is in 13 parcels of more than 100 acres each. At the other extreme, more than half the parcels—74 out of 133—are less than 10 acres each.

BACKGROUND AND TVPOA ORGANIZATION

In response to an increase in development activity in the surrounding region, a number of landowners in the Tassajara Valley formed a group known as the Tassajara Valley Property Owners Association (TVPOA) to represent their common interests in formulating a development plan for the area. In August 1991, the County Board of Supervisors authorized a General Plan Amendment and Rezoning Study for the Tassajara Planning Area in response to a request from TVPOA. The planning area was expanded on its easterly boundary at the County's request to include all lands in the Tassajara Valley within the urban limit line.

TVPOA represents 18 landowners controlling 2,143 acres out of a total of 4,491 acres or about 48 percent of the property within the Tassajara planning area. (See Figure 3-3, Property Owners Map, and Table 3-1, Assessor Parcel Numbers.)

The TVPOA agreement requires each signatory to contribute a fair share of the planning costs. Seventeen landowners committed funds for planning studies, processing fees, and environmental impact report. The other nine landowners committed to reimbursing the others for the advanced funds upon development or sale of their respective properties. The landowners are bound to advance the necessary funds which ensures the financial backing throughout the planning process.

PROPOSED ACTIONS

The TVPOA application requests amendments to the County *General Plan* and Zoning Ordinance. The following changes to the *General Plan* and zoning map would be necessary for the project to be implemented as proposed.

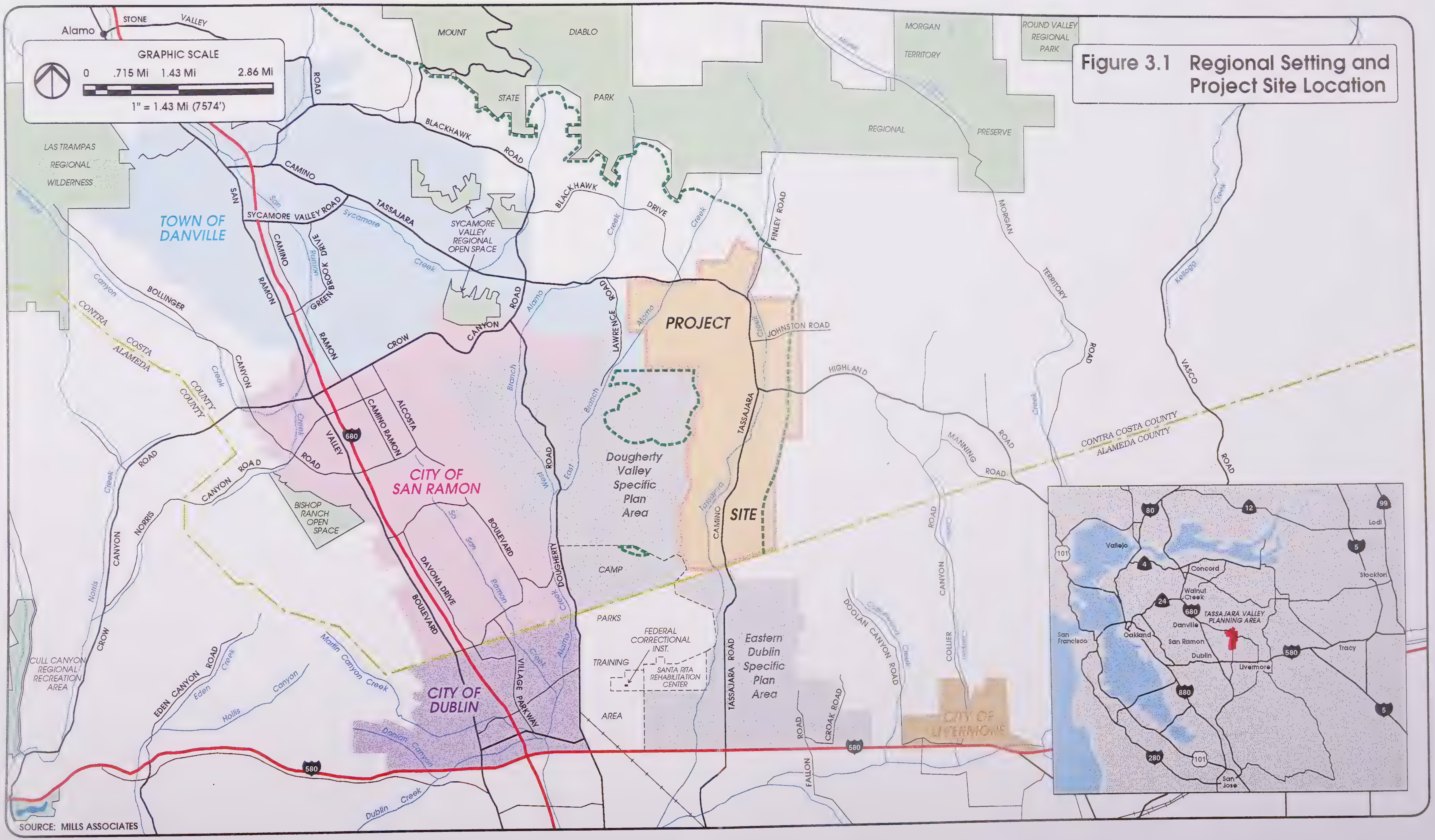
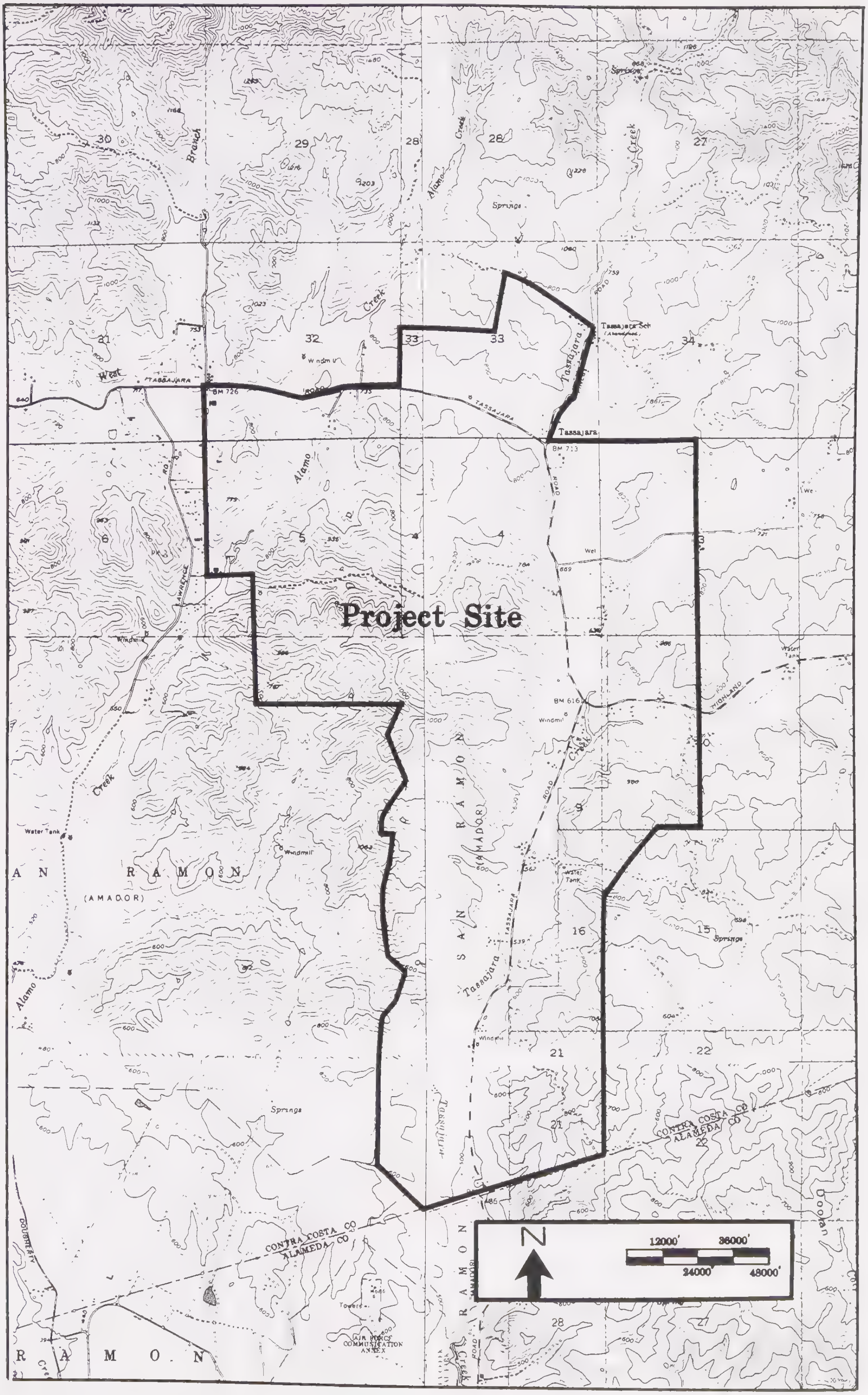


Figure 3.1 Regional Setting and Project Site Location
GRAPHIC SCALE
0 .715 Mi 1.43 Mi 2.86 Mi
1" = 1.43 Mi (7574')
Alamo
STONE VALLEY ROAD
MOUNT DIABLO STATE PARK
MORGAN TERRITORY REGIONAL PRESERVE
ROUND VALLEY REGIONAL PARK
LAS TRAMPAS REGIONAL WILDERNESS
TOWN OF DANVILLE
BLACKHAWK ROAD
CAMINO TASSAJARA
SYCAMORE VALLEY ROAD
SYCAMORE VALLEY REGIONAL OPEN SPACE
BLACKHAWK DRIVE
FINLEY ROAD
MORGAN TERRITORY ROAD
PROJECT SITE
JOHNSTON ROAD
HIGHLAND ROAD
LAWRENCE ROAD
CROW CANYON ROAD
BOLLINGER CANYON
CONTRA COSTA COUNTY
ALAMEDA COUNTY
CITY OF SAN RAMON
Dougherty Valley Specific Plan Area
BISHOP RANCH OPEN SPACE
CAMP PARKS TRAINING AREA
FEDERAL CORRECTIONAL INST.
SANTA RITA REHABILITATION CENTER
Eastern Dublin Specific Plan Area
CITY OF DUBLIN
CITY OF LIVERMORE
CULL CANYON REGIONAL RECREATION AREA
EDEN CANYON ROAD
NORRIS CANYON
DOUGHERTY ROAD
VILLAGE PARKWAY
DAVONA DRIVE
ALCOSTA BOULEVARD
SAN RAMON VALLEY BOULEVARD
TASSAJARA ROAD
DOOLAN CANYON ROAD
FALLON ROAD
CROAK ROAD
COLLIER CANYON ROAD
MANNING ROAD
VASCO ROAD
680
580
TASSAJARA VALLEY PLANNING AREA
Vallejo
Concord
Walnut Creek
Danville
San Ramon
Dublin
Livermore
Oakland
San Francisco
San Jose
Tracy
Stockton
Lodi
SOURCE: MILLS ASSOCIATES



Source: United States Geological Survey

Figure 3-2 USGS Topographic Map

TABLE 3-1: PROJECT AREA ASSESSOR'S PARCEL NUMBERS

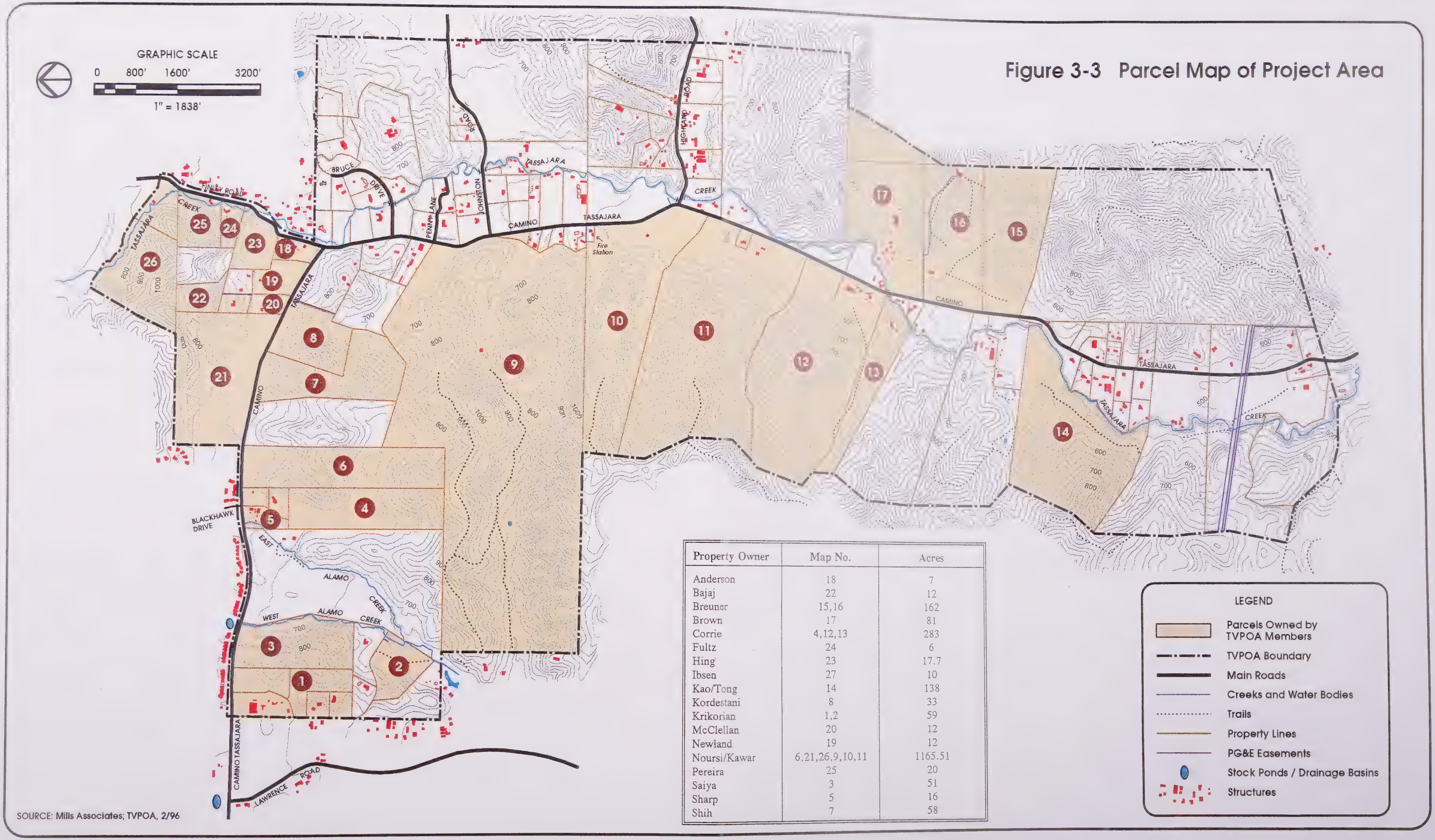
Parcel Number	Acreage	Parcel Number	Acreage	Parcel Number	Acreage
204-090-003	5	205-070-009	11	206-110-007	109
204-090-004	5	205-070-010	11	206-110-008	25
204-090-005	5	205-070-013	5	206-150-021	5
204-090-006	5	205-070-014	5	206-150-022	5
204-090-007	5	205-080-001	269	206-151-013	7
204-090-008	5	205-080-002	4	206-151-014	3
204-090-009	5	205-080-003	4	206-151-020	6
204-100-003	6	205-090-001	34	206-151-023	5
204-100-004	5	205-090-002	30	206-152-004	9
204-100-005	6	205-090-003	6	206-152-006	5
204-100-006	5	205-090-004	5	206-152-007	5
204-100-007	6	205-090-005	5	206-152-008	5
204-100-008	5	205-090-006	19	206-152-009	6
204-100-009	5	205-090-007	36	206-152-010	5
204-100-010	5	205-151-015	4	206-152-011	5
204-100-012	24	206-015-021	5	206-180-001	6
204-110-003	75	206-015-022	5	206-180-002	5
204-160-001	41	206-015-023	5	206-180-004	17
204-160-002	5	206-020-033*	51	206-180-005	19
204-180-001	6	206-030-003*	571	206-190-001*	
204-180-002	5	206-030-006[1]	162	206-190-002*	39
204-180-004	6	206-030-010*	58	206-190-003*	
204-180-005	6	206-030-012	56	206-190-005*	
204-180-007	8	206-030-016*	33	206-190-006*	10
204-180-008	5	206-030-017	24	206-200-001	2
205-040-002	180	206-030-019	26	206-200-002	2
205-040-006	10	206-030-021	11	206-200-003	4
205-040-007	10	206-030-022	7	206-200-004	1
205-040-011	91	206-030-023*	70	206-200-005	6
205-040-012	4	206-030-025*	55	206-220-001	10
205-040-013	10	206-030-026*	11	206-220-002	20
205-040-015	6	206-030-027*	5	206-220-003*	21
205-040-016	7	206-060-005*	228	206-220-004	67
205-040-017	8	206-060-007*		220-100-002*	96
205-040-018	6	206-060-009	2	220-100-003*	
205-050-004*	81	206-060-010	2	220-100-005*	20
205-050-005*	81	206-060-012*	129	220-100-006*	7
205-050-006*	81	206-060-013	1	220-100-007*	17
205-060-004	308	206-060-016*	232	220-100-013*	12
205-070-001	5	206-070-006	128	220-100-014	6
205-070-002	5	206-070-011*	138	220-100-015*	12
205-070-003	5	206-070-013	120	220-100-016*	6
205-070-005	1	206-070-014	19	220-100-019*	12
205-070-006	3	206-110-005	107	220-100-021	16
205-070-007	2	206-110-006	60		
205-070-008	14			TOTAL	4,584

* TVPOA Members as identified on Figure 3-3. Source: TVPOA, 1995.

[1] Wendt Ranch development.

Note: According to TVPOA, acreage data by parcel is derived from County Assessor records and, in aggregate, is not consistent (off by two percent) with the total project acreage as estimated by the applicant.

Figure 3-3 Parcel Map of Project Area



Property Owner	Map No.	Acres
Anderson	18	7
Bajaj	22	12
Breuner	15,16	162
Brown	17	81
Corrie	4,12,13	283
Fultz	24	6
Hing	23	17.7
Ibsen	27	10
Kao/Tong	14	138
Kordestani	8	33
Krikorian	1,2	59
McClellan	20	12
Newland	19	12
Noursi/Kawar	6,21,26,9,10,11	1165.51
Pereira	25	20
Saiya	3	51
Sharp	5	16
Shih	7	58

Proposed General Plan Amendment (#930008)

The applicant has proposed the following amendments to the County General Plan Elements, consisting of revisions to both text and maps:

Land Use Element: Map Modifications

The Agricultural Lands designation for the planning area would be changed to Single-Family Residential (Very Low, Low, Medium and High Densities), Multiple-Family Residential (Low and Medium Densities), Mixed Use, Public/Semi-Public, Parks and Recreation, and Open Space. (See Figure 3-4, General Plan Amendment Map.)

Appropriate changes will be made to the Land Use map to limit overall density within the Tassajara Valley area to 5,950 dwellings, based upon the densities shown on the proposed General Plan Amendment map and proposed Preliminary Development Plan, revised November 1995.

Minor map modifications would be required to relate the mixed-use category to specific sites within the project area.

Land Use Element: Text Modifications

The Land Use Element would be amended to identify the Tassajara areas as a new mixed-use area.

Page 3-17: The *General Plan*'s mixed-use category would be amended to recognize the Tassajara village centers by modifying the last bullet to read: "A Mixed Use category applied in only eleven specific areas of the County."

Page 3-31: The first paragraph would be changed to include Tassajara mixed use areas as M11. (See Dougherty Valley General Plan Amendment which inserted the following on line 4 after (M8) and the semi-colon: "Laurel Road (M-9), the Dougherty Valley Village Center (M-10)"); Tassajara Villages should be added to this list.

Page 3-33: Dougherty Valley GPA added new subsection "j," subsection "k" should be added to describe Tassajara Villages Mixed Use area.

The Land Use Element Map (foldout) must be modified to be consistent with Tassajara GPA Map.

Figure 3-2 must be modified to add Tassajara as No. 25, Dougherty Valley GPA is No. 24.

Page 3-90: Text that describes the County's planning policies for Tassajara would be added.

Urban Limit Line

No change would be made to this line.

Growth Management Element

Figure 4-2 dealing with Level of Service Designations for Unincorporated Areas map should be changed to designate Tassajara as urban or suburban as required.

Transportation and Circulation Element

Figure 5-2 on Roadway Network Plan map, page 5-15, must be modified to show the arterials which are needed to serve the project.

Figure 5-3, Transit Network Plan map, must be modified to show Tassajara as within the "local transit service areas."

Housing Element

Figure 6-1 was changed in Dougherty Valley GPA to include Tassajara in San Ramon Valley Sub-Area.

Table 6-16, beginning on page 6-65, must be modified as necessary.

Figure 6-2, Vacant and Undeveloped Residential Sites in Unincorporated Contra Costa County, must be modified to be consistent with the additions to Figure 6-1.

Public Facilities and Services Element

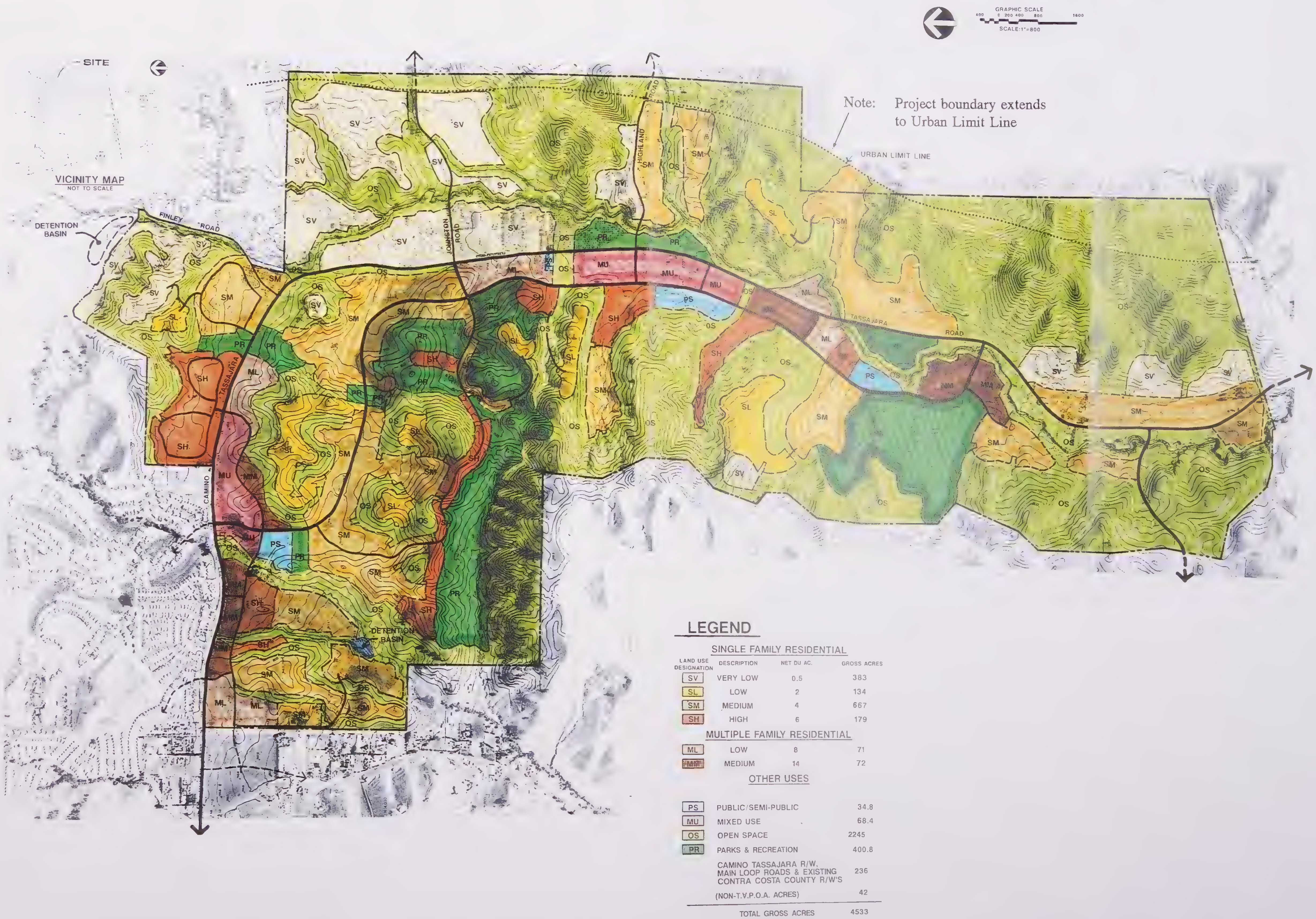
Figure 7-5, Areas of Drainage Plans map, would be modified to show Tassajara as an Urban Use Area.

Figure 7-9, Public School Locations map, would be modified by adding two elementary and one middle school.

Conservation Element

Figure 8-2, Important Agricultural Lands map, would be modified to delete Tassajara planning area.

Figure 3-4 General Plan Amendment Map



Source: TVPOA

Open Space Element

Figure 9-4, Local Parks; Figure 9-5, Bicycle Trails; Figure 9-6, Hiking Trails; and Figure 9-7, Riding (Equestrian) Trails, would all be modified as required.

Noise Element

Figure 11-5, Section P&Q on pages 11-32 and 11-34, Noise Contours, and Table 11-3 page 11-38, Future Noise Levels, would be modified to reflect noise characteristics of the planning area.

Other amendments may be necessary to the *General Plan* to reflect the Tassajara project. Such amendments will be identified throughout the planning process.

Proposed Rezoning (RZ #943022)

Planned Unit District/Zoning Map

The proposed project includes a rezoning of the entire project area from the present Agriculture District to the P-1 Planned Unit District (PUD).

Preliminary Development Plan Application

The County Zoning Ordinance requires the submittal of various plans and reports in support of a PDP request at the time an application is made. Material submitted as part of the TVPOA application includes the following:

Planned Unit District Plan Report

This report describes the applicant's objectives and the major features of the proposed development. The Preliminary Development Plan diagram portrays the proposed land uses, densities, drainage and circulation. (TVPOA, *Planned Unit District Plan*, 1995.) Other maps which are required components of the PDP application are also included:

- Parks & Open Space Diagram (November 1995)
- Grading Plan (October 1995)
- Local Circulation Plan (September 1995)
- Local Community Facilities Plan (September 1995)

The maps are presented later in this section as Figures 3-5 to 3-9.

Design Guidelines

This report presents design details for neighborhood features including entries, streets, landscaping and streetscape, neighborhood green or gathering places and architecture. Special guidelines govern the design of homes in hillside areas. Final development plans, subdivisions and all subsequent development proposals in the Tassajara Valley would be reviewed for consistency with these guidelines. (TVPOA, *Design Guidelines*, 1995.)

Public Facilities Implementation Plan

This document outlines an implementation program which provides that each "community" will meet the infrastructure and public services requirements of the County General Plan Growth Management Element. It also contains a financing plan and a capital improvement plan. (McDonald, 1993.)

Development Agreements

A development agreement is a legal binding document between the County and the developer that governs how the project will be constructed and how various conditions of approval will be implemented. Separate development agreements, based on a standard format, may be drawn between the County and individual property owners at the time each seeks approval of development rights.

According to state law, "A development agreement shall specify the duration of the agreement, the permitted uses of the property, the density or intensity of use, the maximum height and size of proposed buildings, and provisions for reservation or dedication of land for public purposes . . . The agreement may provide that construction shall be commenced within a specified time and that the project or any phase thereof be completed within a specified time. The agreement may also include terms and conditions relating to applicant financing of necessary public facilities and subsequent reimbursement over time." (See Government Code, Section 65865.2.)

The project applicants will separately enter into development agreements pursuant to Government Code Section 65864 et seq. A draft master development agreement has been prepared and is on file with the County. This major development agreement will be used in preparing customized development agreements for individual property owners. The agreements are designed to establish procedures governing, and vest the project applicants' rights regarding, how the project approvals to be granted by the County (e.g., General Plan amendment, rezoning and preliminary development plan) would be carried out. As such, the agreements themselves would not result in environmental impacts.

PROJECT PURPOSE AND OBJECTIVES

The general objective of the project is to create a "community which is integrated with the natural landscape and also captures the friendly, personal essence of a small town" (Armstrong, 1993). The

applicant proposes to create a "small town community," through the use of "village centers, neighborhoods, country roads and a pedestrian/transit friendly atmosphere."

The applicant's stated objectives are (PUD, 1995):

- To develop Tassajara as a high-quality "village" community of significant benefit to Contra Costa County and the nearby region.
- To achieve a lively and cohesive "mixed-use" community that integrates places for living, shopping, working and recreation.
- To create a recognizable identity and sense of place for the area that is in keeping with the rural valley setting.
- To provide a range of housing types that will improve the area's jobs/housing balance and affordability.
- To provide adequate public services to meet community demands including schools, police/fire services, parks and commercial areas to meet the needs of future residents in a timely manner.
- To moderate overall regional traffic congestion, including the cumulative impacts of Tassajara development and neighboring communities.
- To develop a community which is oriented towards reducing auto dependency and can maximize benefits of transit opportunities.
- To develop a comprehensive circulation system that promotes pedestrian use, bicycle use and other non-auto opportunities to minimize congestion at peak traffic hours.
- To encourage unique, imaginative architecture and site design which blends with the agrarian setting.
- To preserve a sense of key historical elements.
- To provide a pedestrian-oriented pattern of residential development and village centers which reinforce the civic, neighborhood focus of the community.
- To create a community which emphasizes "low impact" on resources from water conservation and energy efficiency to recycling.
- To develop a form for residential neighborhoods and village centers that is scaled to pedestrians.
- To provide a major open space system with opportunities for community-wide trail linkages, views, passive recreation and a comprehensive system of wildlife habitat corridors.

- To preserve and protect major ridges and riparian and wetland areas.
- To ensure the preservation of a contiguous habitat ecosystem.
- To encourage innovatively planned, environmentally sensitive development.

The following additional considerations are listed in the applicant's Design Guidelines as having guided the planning of this project:

- Dense development is more suited to the valley floor and lower, less steep portions of hillsides.
- Stream corridors, oak woodlands and wildlife habitat/nesting areas are less suitable for development. Disturbance of existing native trees should be minimized.
- Visible hillsides and knolls are less suited for growth. Upper lands out of view of Camino Tassajara may be more suitable for development. Major ridges are unsuitable for development.
- Lands adjacent to existing development are more suitable for further development.
- Only the landslides capable of affecting future development will be stabilized.
- Areas outside the County Urban Limit Line are less suitable for development.
- Camino Tassajara is suitable as a utility systems service corridor.

PRELIMINARY DEVELOPMENT PLAN LAND USE SUMMARY

The project would consist of a mix of housing types, community and neighborhood park areas, two "village centers" providing local commercial and public services, three school sites, an 18-hole golf course and open space. The main existing arterial roadway serving the project area would be Camino Tassajara. New roadways or existing roads that would be extended to serve the project area include the Country Loop Road, Johnston Road, Highland Road and the Windemere Parkway.

As shown in Figure 3-5, Preliminary Development Plan, and Table 3-2, Proposed Land Uses, the proposed project would develop as a residential and mixed-use community with a total maximum number of 5,228 dwelling units occupying 1,506 acres. Mixed-use commercial areas would provide up to 722 dwelling units, 300,000 square feet of retail, commercial and office space, and would occupy approximately 68 acres. Parks and a proposed golf course would occupy 401 acres and public and semi-public facilities (such as fire station and schools) would occupy 271 acres. The remaining 2,245 acres would be retained as open space.

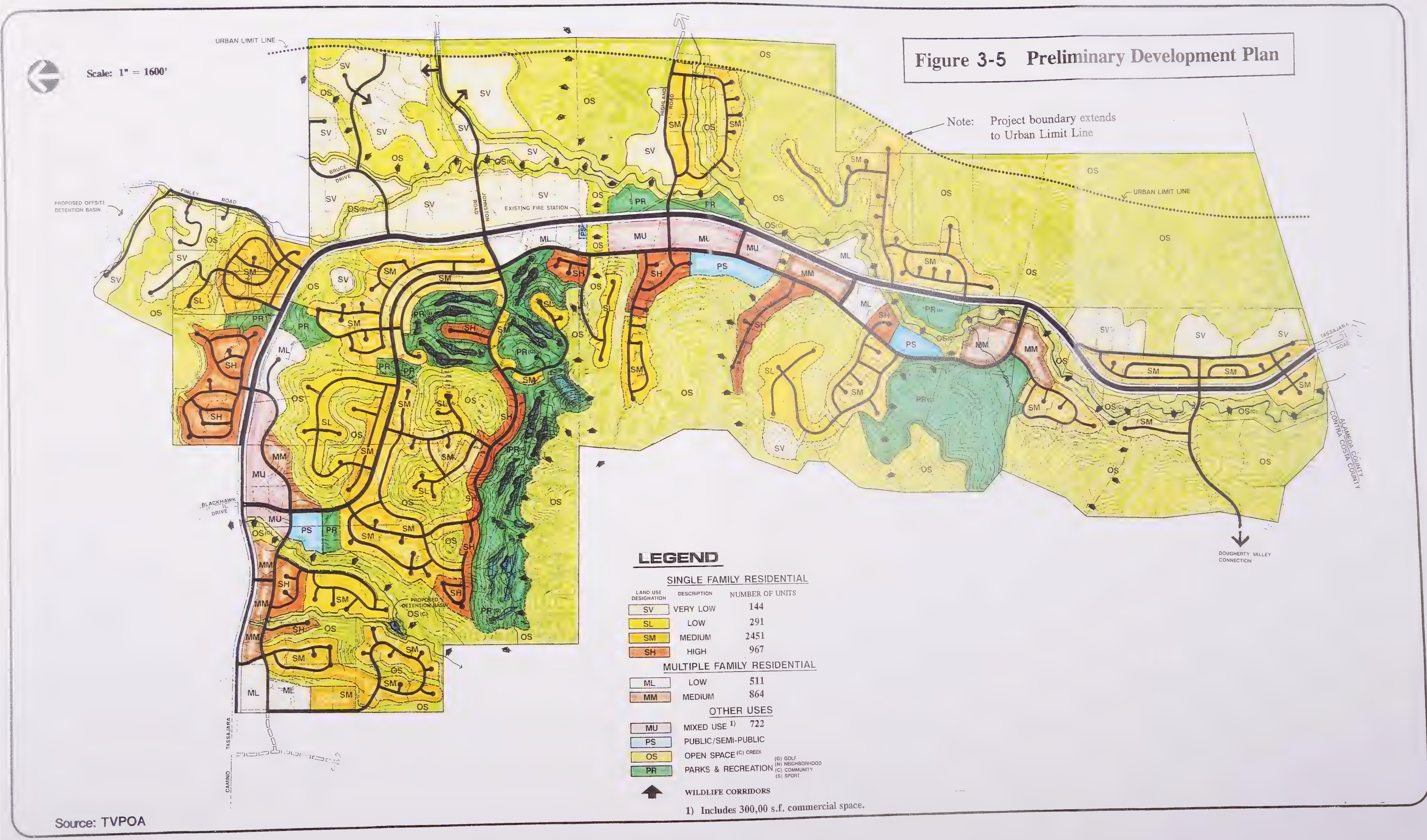


Figure 3-5 Preliminary Development Plan

Source: TVPOA

TABLE 3-2
PROPOSED LAND USES - TVPOA

Land Use	Gross Acres	Net Acres[1]	Density	Square Feet	Dwelling Units[2]
RESIDENTIAL					
Single-Family Very Low (SV)	383	287	0.5		144
Single-Family Low (SL)	134	101	2.9		291
Single-Family Medium (SM)	667	500	4.9		2451
Single-Family High (SH)	179	134	7.2		967
Multi-Family Low (ML)	71	57	9.0		511
Multi-Family Medium (MM)	72	58	15.0		864
SUBTOTAL	1,506				5,228
MIXED-USE					
Commercial/Office				300,000	
Residential					722
SUBTOTAL	68			300,000	722
PARKS, RECREATION, OPEN SPACE					
Neighborhood Parks	49				
Community Parks	143				
Golf Course (Community Park)	209				
Open space, detention ponds & stream corridors	2245				
SUBTOTAL	2,646				
PUBLIC/SEMI-PUBLIC FACILITIES					
Major Roads	236				
Fire Station	1				
Schools	34				
SUBTOTAL	271				
TOTAL	**4,491**			**300,000**	**5,950**

1 TVPOA states that net acreage includes all land area used exclusively for residential purposes and excludes streets, highways and all other public rights-of-way. Net acreage is assumed to constitute 75 percent of gross acreage for all uses, except for the Multi-Family designations, where it is assumed to comprise 80 percent.

2 The residential unit count includes existing houses to remain or be replaced.

Source: TVPOA, 1995.

Residential Uses

Residential development would be the principal land use of the project area, with higher density dwellings located on the valley floor adjacent to major roads, intersections and community facilities. A broad range of unit types and densities will be included, with a portion of the units developed as "affordable" to moderate-income households (Armstrong, 1993). Some residences would be included in special mixed-use areas, combining residential with retail and office uses.

The proposed housing types, *General Plan* designations and gross acres per housing type are shown in Table 3-2. The *General Plan* provides a density range for each residential land use category. The applicant's Preliminary Development Plan shows the maximum number of units within each land use category. The applicant has further described the proposed housing types by density, market price (in 1990 dollars) and unit size. (See Table 3-3, Housing Characteristics and Occupancy. Note that this table does not reflect "affordable" market prices/information not available from the applicant.)

TABLE 3-3
HOUSING CHARACTERISTICS AND OCCUPANCY

	Units	Mkt. Price	Sq. Ft.	Vacancy Factor	Occupied Dwellings	Persons per Occ. Dwelling	Potential Population
SV	144	$565,000	3,600	2.0%	141	3.1	436
SL	291	$465,000	3,000	2.0%	285	3.0	857
SM	2,451	$365,000	2,000	2.0%	2,402	3.0	7,207
SH	967	$275,000	1,800	2.0%	948	2.5	2,368
ML	511	$235,000	1,600	2.0%	501	2.0	1,002
MM	864	$175,000	1,200	3.0%	847	1.8	1,509
MU	722	$152,000	1,040	4.0%	707	1.6	1,109
Total	**5,950**				**5,831**		**14,487**

Source: TVPOA, 1995; Hurt, 1993.

Village Centers and Mixed Uses

The mixed-use district is proposed at the two Village Centers covering about 68 acres in aggregate. (See Figure 3-5, Preliminary Development Plan.) This district would accommodate any of the following: neighborhood shopping, such as grocery and drug stores, video rental stores, restaurants, dry cleaners, etc.; local serving professional offices, such as banks, copier services, travel agencies and medical offices; and community facilities, such as churches, child care facilities, post office, community buildings, etc. Seven hundred twenty-two multiple-family housing units, consisting of apartments and/or condominiums, would also be included, either fully integrated with commercial/office

uses or in close proximity to them. The plan allows for 300,000 square feet of commercial/office space. Uses would be housed in a variety of building configurations, including anchors, stand-alone pads and small store-front buildings, with small plazas and courtyards interspersed. Envisioned in the applicant's PDP booklet are centers that would provide a "mix and configuration" of uses designed to encourage neighborhood related commerce and social gatherings.

Mixed-use areas would be designed to minimize automobile travel, by including access to a system of pedestrian and bicycle trails, and provisions for bus transit. Telecommuting facilities and a park-and-ride lot would be developed in one of the Village Centers (PUD Plan, 1995).

Parks and Recreation Facilities

The Preliminary Development Plan provides the following acreage of parks and public open space:

Neighborhood Parks	49 acres
Community Parks	143 acres
Public Golf Course	209 acres
TOTAL	401 acres

The four neighborhood parks would vary in size from six to nineteen acres with one of the parks located beside a school facility. The remaining three neighborhood parks, the 19-acre Tassajara Creek Park, the 17.8-acre Finley Park and the 5.9-acre golf park would be located on adjacent collector roads to maximize park usage and accessibility. (See Figure 3-6, Parks & Open Space Diagram.) Community parks include the 15-acre active sports park and the 128-acre West Community Park. The West Community Park would be more natural than the neighborhood parks and is intended to serve as transition elements between the developed community and the rural open space areas. The Design Guidelines (1995) describe this park as providing residents with an opportunity to enjoy the natural area while protecting biologically sensitive habitats. Contained within the 128-acre park are eight acres for active sports facilities. Also included in the project plans is a public eighteen-hole golf course which is also intended to provide a transition from urban to natural uses.

Trails, Open Space and Natural Resources

The plan designates 2,245 acres as protected open space and wildlife habitat, including creek corridors, storm water detention areas, limited agricultural areas and grazing lands (see Figure 3-6). Major ridges are to be retained in open space, with development limited to trails for public use. Creek corridors would be improved and enhanced for wildlife habitat, flood control and trail use. The continuous network of trails throughout the project would link the developed portions of the project to the regional open space system.

Corridors for wildlife movement are proposed, with underpasses to allow the safe crossing of Camino Tassajara. The oak woodland located in the open space district, just south of the proposed golf course,

would be preserved, as would specimen trees and a golden eagle nest. The applicant proposes the following options for ownership or management of the project open space (Armstrong, 1993):

- East Bay Regional Park District (EBRPD)
- Community Services District (to be created)
- Private ownership, with appropriate open space and access easements
- Flood Control District (ownership or easements over creeks)

Circulation and Transportation

The main access to and through the planning area is Camino Tassajara, which is proposed to be a fully landscaped parkway from the western edge of the project area to the Alameda County line at the southern boundary. (See Figures 3-7(a), Local Circulation Plan and 3-7(b), Circulation Plan Road Sections.) The roadway would be six lanes wide from the western project boundary to a point near the Blackhawk east gate where it would revert to four lanes from this point to south of Highland Road, returning to six lanes from south of Highland Road to the County line.

To reduce volumes on Camino Tassajara, the applicant proposes an internal, parallel-loop road south and west of Camino Tassajara to interconnect the various sub-areas. This would be a two-lane minor arterial road, which would also serve as a pedestrian, bicycle and transit circulation route. A network of local collectors and smaller streets would serve the residential neighborhoods. A collector road at the south end of the planning area, linking the project to the Dougherty Valley development, is proposed through the hills west of the project area.

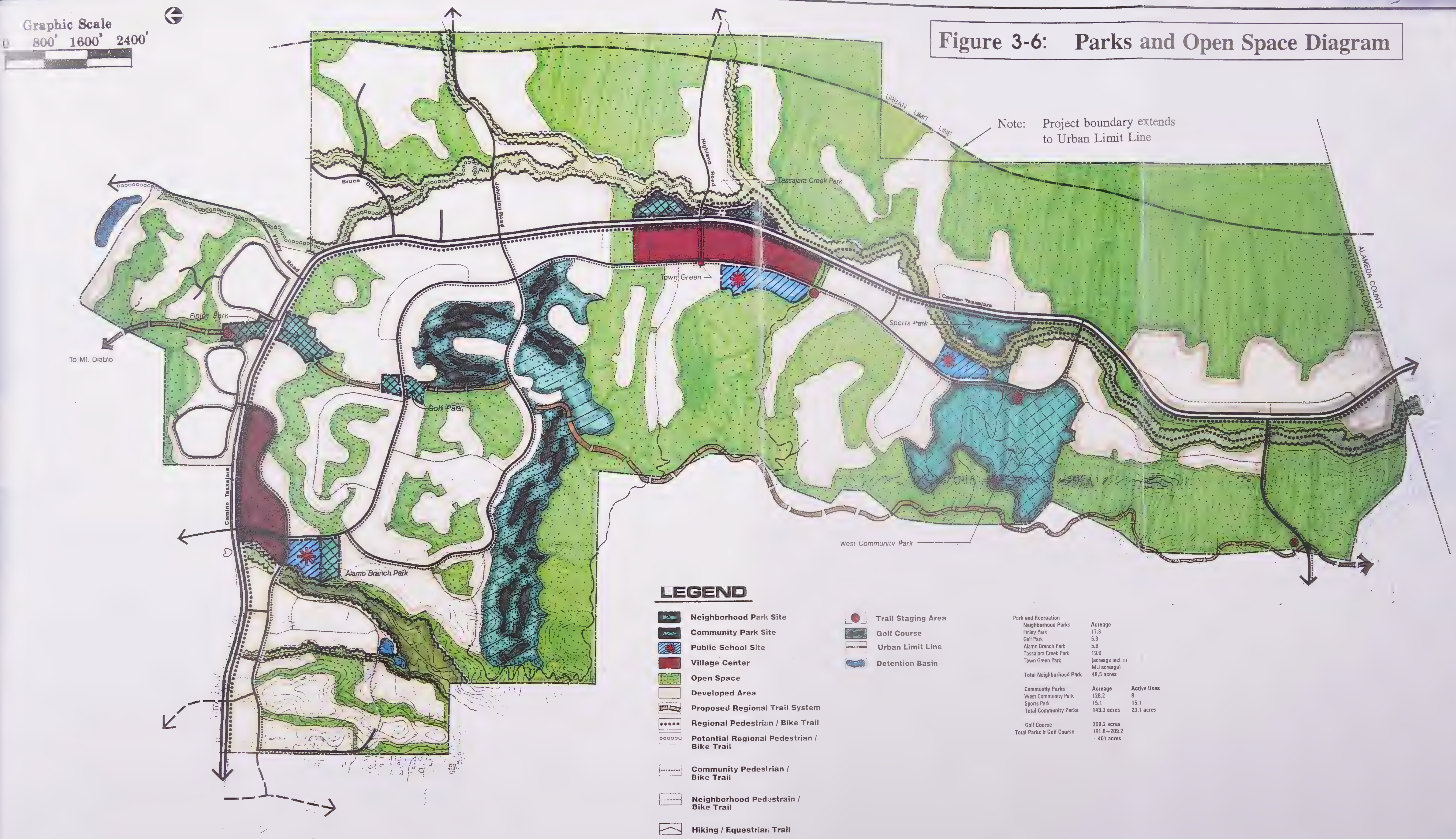
Camino Tassajara and the Country Loop Road would accommodate pedestrians and bicycle riders according to the *Local Circulation Plan* (TVPOA, 1995). Hiking and riding trails are proposed along creeks and through open space areas to link various neighborhoods, as well as tied to regional open space areas beyond the project.

Public Services and Infrastructure

The project area is within the San Ramon Valley Unified School District. The Community Facilities Plan provides for one middle school, to be located near the Village Center at the Camino Tassajara/ Highland Road intersection, and two elementary schools, to be located at the north and south ends of the loop road (see Figure 3-8, Community Facilities). The applicant has stated that the project area would be served by a high school that is proposed as part of the Dougherty Valley Specific Plan, rather than proposing to build an additional high school in the project area.

Police service would be provided by the County Sheriff's Department. The project area is within the service area boundaries of the San Ramon Valley Fire Protection District, which would also provide paramedic ambulance services. The applicant has not indicated their intent to remodel or rebuild the existing fire station on Camino Tassajara between Johnston and Highland Roads (see Figure 3-8) at the time of application submittal.

Figure 3-6: Parks and Open Space Diagram



Park and Recreation

Neighborhood Parks	Acreage	
Finley Park	17.8	
Golf Park	5.9	
Alamo Branch Park	5.8	
Tassajara Creek Park	19.0	
Town Green Park	(acreage incl. in MU acreage)	
Total Neighborhood Park	48.5 acres	
Community Parks	**Acreage**	**Active Uses**
West Community Park	128.2	8
Sports Park	15.1	15.1
Total Community Parks	143.3 acres	23.1 acres
Golf Course	209.2 acres	
Total Parks & Golf Course	191.8+209.2 −401 acres	

Source: TVPOA

The storm drainage plan proposes to intercept the first one-half inch of each storm's developed-area runoff and convey it to facilities, such as detention basins or grassy swales, for reducing non-point source urban runoff. Detention basins are proposed both on- and off-site to create no net increase in off-site flows upon project buildout.

The project site is not within either the East Bay Municipal Utilities District (EBMUD) or the Dublin-San Ramon Services District (DSRSD). A study funded by TVPOA for DSRSD has been completed to determine the feasibility of DSRSD providing water and recycled water service to the project area (Corolla, 1995).

For wastewater collection and disposal, one part of the project area is proposed to be served by the Central Contra Costa Sanitary District and the remaining portion by the Dublin-San Ramon Services District. An existing gravity system in Camino Tassajara would provide sanitary sewer service to the northwest corner of the project; a proposed pump station at the south end of Lawrence Road would serve a portion of the northwest area. The remaining portion of the project area would require a new gravity system, with treatment proposed by DSRSD. A study funded by TVPOA for DSRSD has been completed to determine the feasibility of the District serving the entire site (Corolla, 1995).

The new PG&E substation located on Camino Tassajara, one mile east of Blackhawk Drive, will provide electricity to the project. Natural gas would also be provided by PG&E. Pacific Bell would provide telephone service from the new Tassajara Central Office located north of Camino Tassajara at Blackhawk Drive.

Grading

Extensive grading would occur within project boundaries (see Figure 3-9, Site Grading Plan). Some of the designated open space area would be graded and essentially 100 percent of the developed land would be graded. The overall grading concept is to construct graded pad areas with most of the development concentrated on the valley floor with the highest ridges of the project retained as open space. Development, and therefore grading, would occur on 36 percent (2,115 acres) of the project area. Most of the proposed grading would take place on land with an average slope of less than 26 percent, but approximately 470 acres of land exceeding 26 percent slope is proposed for grading, of which 251 acres would be developed.

The grading of open space lands is chiefly of hillside areas on the perimeter of the development. These graded slopes will have gradients of 3:1. They would be contour graded and revegetated and would be separated from the developed lands by a buffer that could consist of debris catchment areas, buttress fills, drainage courses, fire access roads or grassy swales.

The amount of cut and fill for the total project has not been estimated by the applicant. The project engineer, however, has stated that although each phase of the project may not achieve balance between cut and fill, the overall grading for the entire site will be balanced. Grading material will not have to

be imported to or exported from the project area but will be "borrowed" from within the project site if needed for a particular development phase. No stockpiling of materials will be permitted between phases (dk Associates, 1995). An analysis of this information along with identification of impacts is provided in Section 4.2, Geology/Seismicity/Soils.

PROJECT POPULATION AND EMPLOYMENT

Assuming an average vacancy factor of 2.4 percent, and 2.4 persons/household, the Tassajara development would accommodate a population of 14,487 residents (refer to Table 3-3). Employment within the project area would be provided by the 300,000 square feet of local commercial and office uses proposed (TVPOA, 1995).

GROWTH MANAGEMENT, PHASING AND CAPITAL IMPROVEMENT PLAN

Growth Management

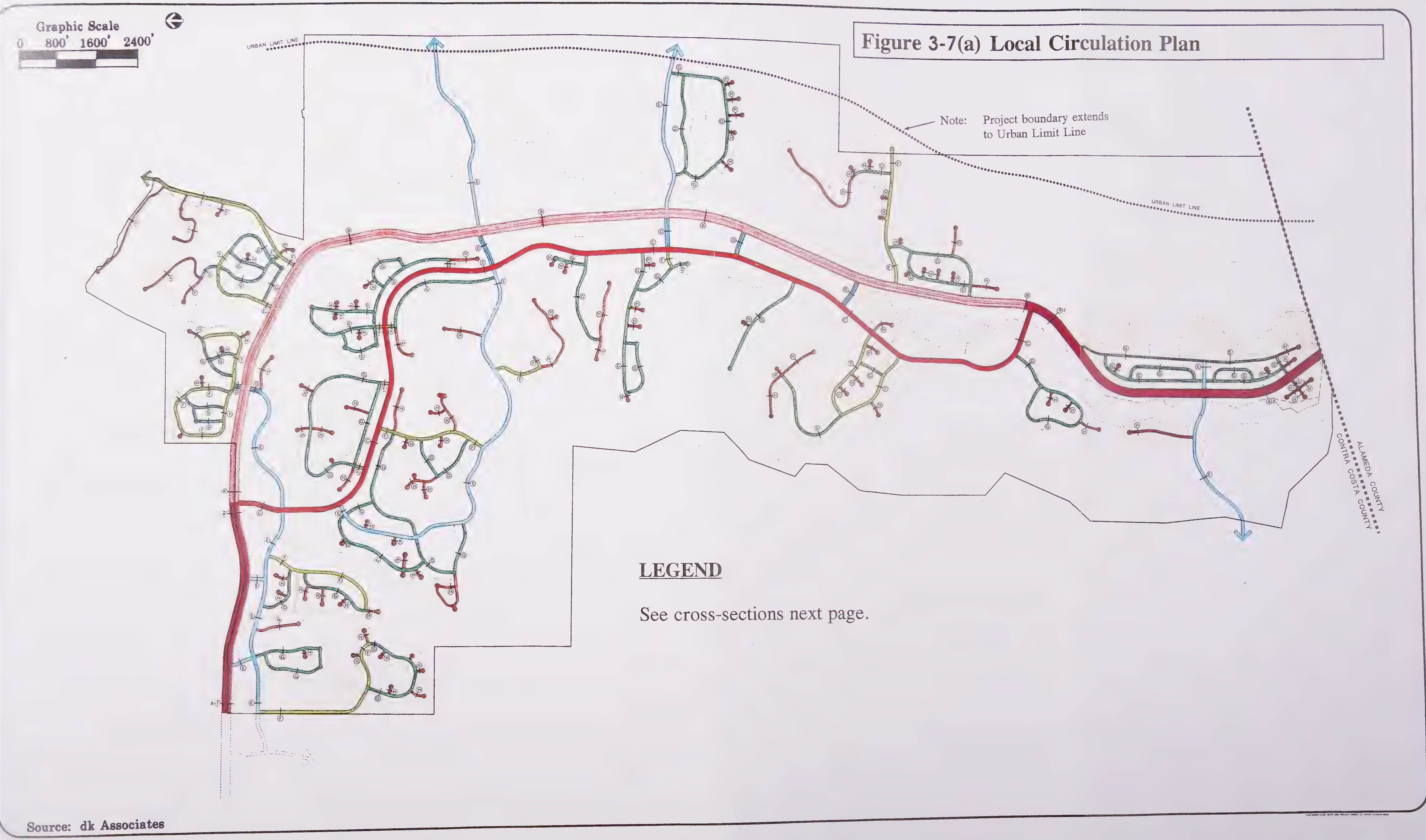
The application calls for the timing and phasing of the project to be consistent with the County's Growth Management and Public Facilities/Services Elements which establish policies and standards to ensure that the necessary infrastructure will be in place to support growth during the buildout of the project, that new development pays its fair share of costs, and that new development occurs in a logical and orderly manner.

Preliminary Phasing Plan

Figure 3-10, Proposed Project Phasing, illustrates the anticipated phasing of the project. The timing of development in Tassajara will be phased in accordance with market demand, over a period of almost 20 years. For purposes of analysis, the map assumes that development will begin in the northwestern quadrant, proceeding south and eastward over the buildout of the project. The first phase is currently estimated to encompass half of the total unit count and consume half of the projected time line. The smaller second, third, and fourth phases would encompass the second half of the total unit count and finish out the rest of the projected time line. The development forecast estimates that the annual unit absorption will range from approximately 220 to 400 residential units.

The phases may overlap in time, as shown in Table 3-4, when the market demand for a certain price or home type cannot be met within a given phase. Landowners who are prepared to develop may suggest a different sequence of development than shown on the Phasing Map, if they can demonstrate to the satisfaction of Contra Costa County that the development sequence they propose will both meet the adopted Level of Service targets, and "stand alone" if subsequent phases are delayed indefinitely.

Figure 3-7(a) Local Circulation Plan

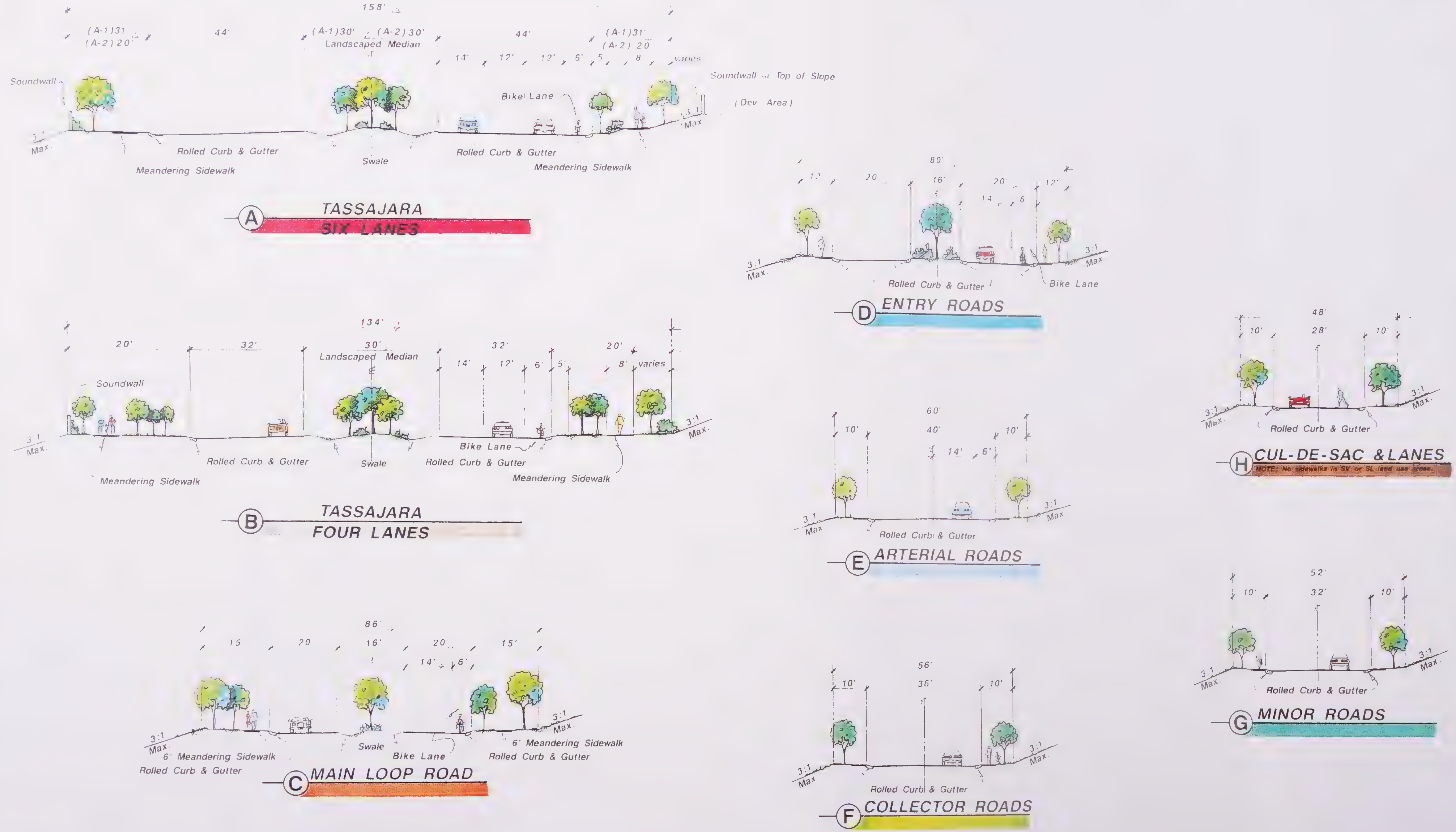


LEGEND

See cross-sections next page.

Source: dk Associates

Figure 3-7(b) Circulation Plan - Road Sections



Source: dk Associates

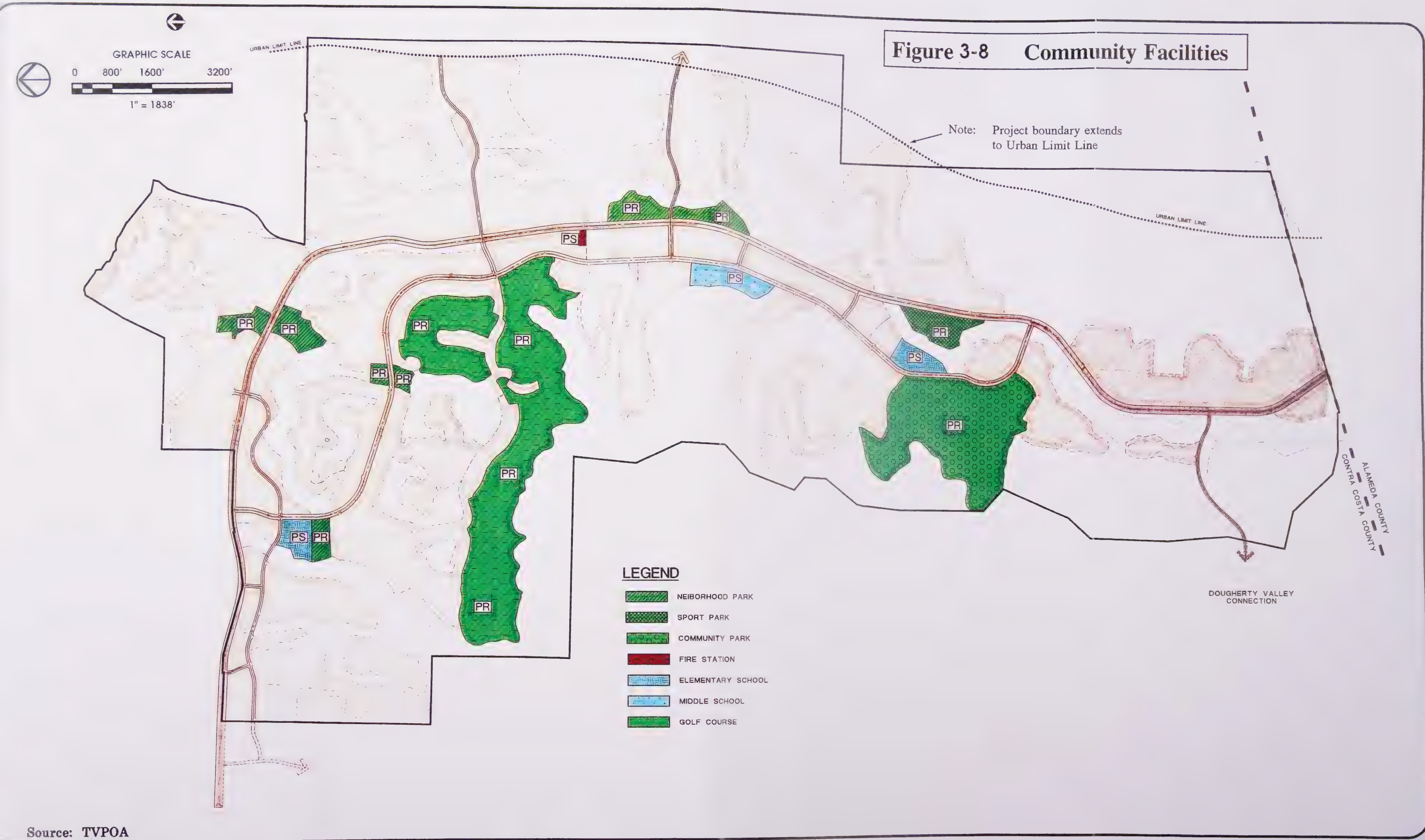


Figure 3-8 Community Facilities

Source: TVPOA

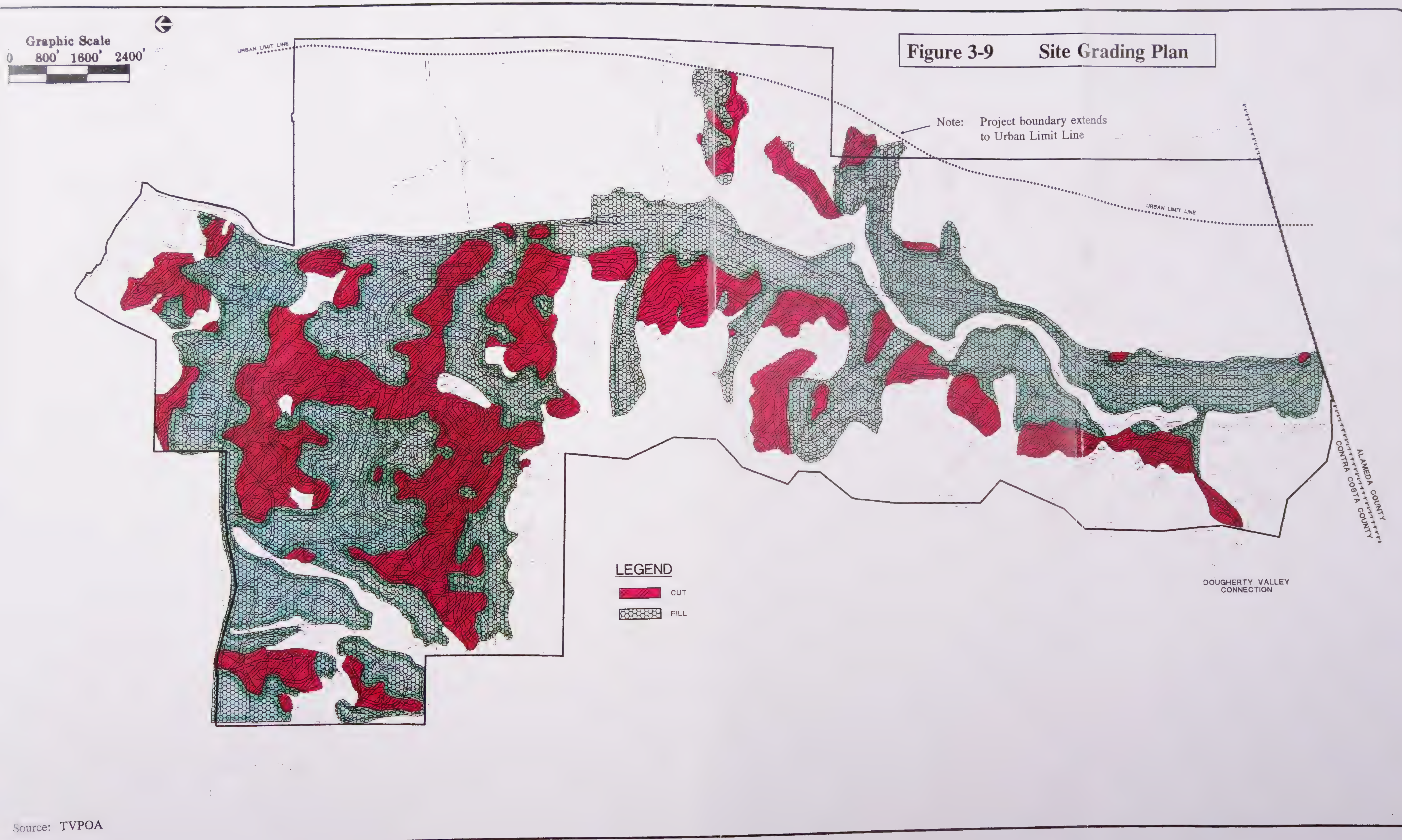


Figure 3-9 Site Grading Plan

Source: TVPOA

Figure 3-10 Proposed Project Phasing

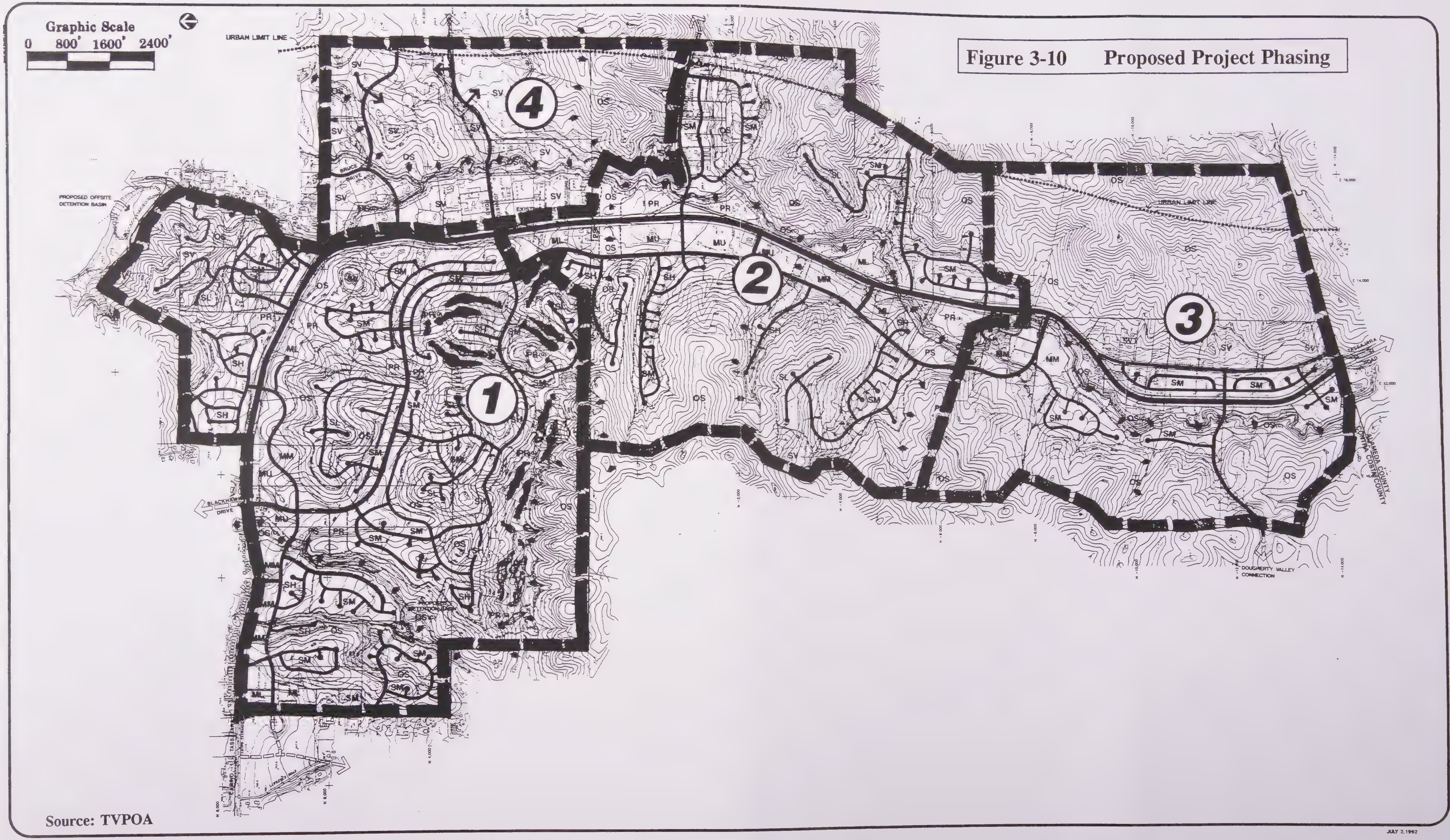


TABLE 3-4
DEVELOPMENT BY PHASES

	Total	Single-Family Very Low	Single-Family Low	Single-Family Medium	Single-Family High	Multi-Family Low	Multi-Family Medium	Mixed Use	Commercial (sf)
Phase 1[1]	3,056	19	153	1,342	643	258	333	308	128,000
Phase 2	2,029	11	138	734	324	253	155	414	172,000
Phase 3	773	22	0	375	0	0	376	0	0
Phase 4	92	92	0	0	0	0	0	0	0
Total	**5,950**	**144**	**290**	**2,451**	**967**	**511**	**864**	**722**	**300,000**

[1] Includes units for the Wendt Ranch proposed under TVPOA plan.

Source: TVPOA, 1995.

Capital Improvement Plan

The application also contains a Capital Improvement Plan (CIP) that would be adopted by Contra Costa County at the time that the Tassajara PUD Plan is adopted. This CIP describes roads, parks and other public improvements that would assure that Level of Service standards are met in a timely manner. Each CIP will specify that public improvements be constructed in step with or in advance of development of any phase.

As with the Phasing Plan, if the CIP that is shown in the application is modified, the proposed CIP for each phase must guarantee performance at the Level of Service specified and guarantee a "stand-alone capability." Each CIP must be accompanied by a realistic program for financing all public improvements required for that phase to develop. In many cases, it will be necessary to build infrastructure that will benefit phases that develop subsequently. In such cases, the financing plan may call for equitable reimbursement from future phases. However, the financing plan does not depend on financing from communities that develop subsequently.

SUBSEQUENT PROJECTS

Subsequent projects includes those projects and approvals necessary to implement the General Plan Amendment, P-1 Zoning, Preliminary Development Plan and Development Agreement. Such subsequent projects include, but are not limited to, the following (Curtin, 1995) and may require additional environmental review:

Final Development Plans and Modifications

Under the requested P-1 Zoning, a final development plan will be required for future development. Multiple final development plans are anticipated for various future developments and ownerships within the preliminary development plan boundary and each of these may be modified periodically.

Modifications to the Preliminary Development Plan and Other Components of the P-1 Project Application

It may be necessary to make modifications to the Preliminary Development Plan and other parts of the P-1 application, such as the Design Guidelines, Public Facilities Implementation Plan, Grading Plan, Major Infrastructure Improvement Plan and Phasing.

Tentative Subdivision and Parcel Maps

A tentative subdivision or parcel map will also be required for subdivision of property within the project area. Many subdivision maps may be prepared for a single final development plan as each individual neighborhood is developed.

Lot Line Adjustments

Lot line adjustments may also be requested in the future to adjust property lines to facilitate the project and subdivisions.

Land Use Permits

Land use permits may be required for the development of specific uses in the project area.

Grading Permits

Grading permits will be required for each development parcel in accordance with the subdivision requirements.

Building Permits

Building permits for residential, commercial and other buildings will be requested following approval of a final subdivision map or similar entitlement for each development area.

Infrastructure Improvement Plans and Capital Improvement Plans

Infrastructure improvement plans and/or capital improvement plans will be reviewed and approved prior to the issuance of a final subdivision or similar entitlement for each phase of development.

Existing Spheres of Influence and Existing Service Boundaries

Applications to the Local Agency Formation Commission (LAFCO) for changes in existing spheres of influence, changes in existing boundaries, and creation of new districts, may be necessary to provide the following services:

Water

Possible providers include Dublin San Ramon Services District (DSRSD) and East Bay Municipal Utility District (EBMUD).

Sewer

Possible providers include DSRSD and Central Contra Costa Sanitary District (CCCSD).

Parks and Recreation

Possible provider includes East Bay Regional Park District.

Creation of Other New Service Districts

If annexation into an existing district cannot be achieved for a particular service need, then districts may need to be formed to provide some of the services. In addition, the following special districts may need to be formed to serve the new development:

Landscape and Lighting District

A landscape and lighting district could be created and made responsible for maintaining common area landscaping, adjacent landscaping easements, fuel modification areas (for wildlife management), project identity signs and monuments, and other similar maintenance functions. Such maintenance areas may be established for the maintenance of street lighting and drainage facilities within the project which were not maintained by another district.

Geologic Hazard Abatement District

A geological hazard abatement district could be established to provide a mechanism for funding any preventative, maintenance or remedial work that might be required due to a landslide or designated geologic hazard within open space or graded areas of the project. The boundary of such a district would be based on the area to be developed and a determination of how open space lands are to be handled by the project.

Financing Districts

One or more financing mechanisms may also need to be established to ensure timely completion and timely maintenance of public improvements. Numerous financing district or other financing mechanisms are possible including lighting and landscaping districts, Mello-Roos Districts, assessment districts, county service areas, community service districts, etc.

County Service Areas

County Service Areas could be created and made responsible for maintaining open space areas and parks. Community Service Areas can also be created and made responsible for the provision of other services, such as community facilities and police protection and the like.

OTHER JURISDICTIONAL APPROVALS

As the Lead Agency, the County also intends that this EIR serve as a CEQA-required document for environmental permits, agreements and other approvals which may be made by other agencies, including but not limited to, the local, regional, state and federal agencies and approvals listed in Table 3-5.

REFERENCES

Contra Costa County, 1993, "California Environmental Quality Act Compliance Initial Study," 16 April.

Curtin, Patricia, 1995, Gagen, McCoy, McMahon & Armstrong, letter to Carolyn Mills, 5 December.

Hurt, Anthony, 1993, Letter to Robert Goldman, Angus McDonald & Associates, 27 October.

Klinge, Charles, 1994, Gagen, McCoy, McMahon & Armstrong, letter to Carolyn Mills, with Enclosures, 26 May.

Klinge, Charles, 1993, Gagen, McCoy, McMahon & Armstrong, letter to Jim Cutler, 23 December.

McDonald, Angus, & Associates, 1993, *Public Facilities Implementation Plan for the Tassajara Communities*, July.

Palffy, Andy, 1995, dk Associates, memo to Darwin Myers, 15 November.

TVPOA, 1995, *Tassajara Valley: General Plan Amendment, Rezoning to P-1 District, and Preliminary Development Plan, Planned Unit District (PUD) Plan,* and *Design Guidelines*, Revised 29 November.

TABLE 3-5
REQUIRED APPROVALS

Agency	Approval
Contra Costa County	• Certification of Master FEIR • General Plan Amendment • Preliminary Development Plan and Rezoning • Development agreements (when requested) • Cancellation of Williamson Act Contracts • Final Development Plans for individual sites or phases • Grading permit • Lot line adjustments
CC County Local Agency Formation Commission (LAFCO)	• New boundaries for all community service districts; potential establishment of open space service area
Alameda County LAFCO	• New boundaries for DSRSD and/or EBMUD; may transfer this authority to CC County
Central CC Sanitary District	• Annexation to provide sewer service, if approved by County and LAFCO
CC County Flood Control and Water Conservation District	• Flood control facilities
Dublin San Ramon Services District	• Annexation to provide sewer and water supply service, if approved by County and LAFCO; delivery of reclaimed water, if approved by County
Bay Area Air Quality Management District	• Indirect Source Permit may be required by new regulations
California Regional Water Quality Control Board, San Francisco Bay Region	• Stormwater Pollution Prevention Permit • Waste Discharge Permit for recycled water (DSRSD may secure this permit)
California Department of Fish & Game	• Streambed Alteration Permits
East Bay Regional Park District	• Possible approval of dedication of open space lands, trails, etc.
U.S. Fish & Wildlife Service	• Possible Incidental Take Permit under Endangered Species Act
U.S. Environmental Protection Agency/ Army Corps of Engineers	• May be required re: filling wetlands and jurisdictional waters under Clean Water Act (404 nationwide permit)

Source: TVPOA/Mills Associates, 1996.

4.0 ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

4.1 LAND USE AND PLANNING POLICY

This section examines the potential land use impacts of the Tassajara project and the project's consistency with planning policies. Land use impacts include the relationship of the project to surrounding land uses, the internal compatibility of the project's various components and the conversion of agricultural land to urban and suburban uses. The Tassajara project is located solely within unincorporated Contra Costa County and, therefore, the project's consistency with the County's goals, policies and ordinances are of primary concern. Policies of adjacent communities, regional agencies and local service districts are presented when relevant.

SETTING

Topography

The 4,491-acre plan area is composed of a series of rolling hills and ridges that are cut by two principal valleys which intersect within the project area; the Tassajara Valley which runs north-south, and the Sycamore Valley, which runs east-west (see Figure 4.1-1, Aerial Photograph). Two minor valleys are also included in the planning area, the Lawrence valley at the western border of the planning area and the Finley Valley located at the northeastern corner of the area. These four valleys are defined by hills and ridges that generally run east-west and rise from the valley floors (approximately 700 feet elevation) to approximately 1,000 feet. A substantial portion of the area contains slopes in excess of 26 percent. Portions of the project area have been identified as earth flows, debris flows or soil slumps.

The principal water courses in the planning area are Tassajara Creek, which runs south along the floor of the Tassajara Valley, and Alamo Creek, which runs south through the eastern portion of the area. Both streams, along with their larger tributaries, are considered Jurisdictional Wetlands and "Waters of the U.S."

Primary vehicle access to the planning area is from either the west or the south. The Sycamore Valley is traversed by Camino Tassajara which turns south at Finley Road and travels through the Tassajara Valley continuing into Alameda County and connecting with I-580 approximately three miles south of the planning area. There are five existing roadways intersecting with Camino Tassajara within the planning area boundaries: Finley Road, Bruce Drive, Penny Lane, Johnston Road and Highland Road. Highland Road travels east from Camino Tassajara to north Livermore. Johnston Road, Bruce Drive, Penny Lane and Finley Road serve existing residences and terminate close to the project boundaries.

Land Use

Adjacent Land Use

The Tassajara planning area is bordered by both urban and rural land uses. The plan area is bounded by the Town of Danville on the northwest, the unincorporated community of Blackhawk and unincorporated ranches on the north, the Dougherty Valley Specific Plan area on the west and rural ranch lands to the east. To the south, the plan area is bounded by the Alameda County line. The adjacent lands in Alameda County are within Dublin's Sphere of Influence (SOI). Figure 4.1-2 shows the Tassajara planning area in the context of the surrounding communities.

Camino Tassajara is heavily developed with residential and commercial development in Danville, west of the planning area, which together with Blackhawk, contribute to an urban environment. Single-family residential development in Danville lies adjacent to the project boundary along Lawrence Road and is comprised of a combination of large lot residential uses and semi-agricultural uses such as stables, dog training facilities, etc. (Figure 4.1-3). Recent approval of the Wendt Ranch General Plan Amendment and Subdivision Map will locate housing across from the Blackhawk east gate. Pending approval, more than 200 houses will be constructed at the southeast quadrant of Camino Tassajara/Lawrence Road intersection, adjacent to the project boundary.

Immediately to the north of the planning area is Blackhawk. Developed in the 1980s, Blackhawk is an exclusive, gated residential community of large residences focused around two golf courses. The Shadow Creek residential development is a more conventional residential subdivision that also lies opposite the planning area north of Camino Tassajara (Figure 4.1-3). The remainder of the area north of the planning area is undeveloped grazing land.

The planning area is bordered on the east by rural agricultural land under County jurisdiction. With the exception of some large lot rural residential development adjacent to Finley Road on the east, there is no significant development east of Camino Tassajara. Dougherty Valley is an undeveloped and unincorporated portion of County land lying adjacent to the project area on its western boundary. Currently grazing land, Dougherty Valley has an approved Specific Plan for extensive development. The northwest corner of Dougherty Valley is currently proceeding with development and is known as the County Club at Gale Ranch.

South of the planning area lies Alameda County. Currently undeveloped grazing land, the area south of the County line lies in unincorporated East Dublin. East Dublin is slated to be annexed to the City of Dublin and to develop under the *Eastern Dublin Specific Plan*. Camp Parks lies to the southwest of the TVPOA planning area. Owned by the federal government, Camp Parks (a reserve military training facility) is expected to be retained by the federal government for future use (see Figure 4.1-2).

Existing Land Use

The Tassajara and Sycamore Valleys are principally in agricultural use, which includes spring pasture and livestock grazing, orchards and equestrian facilities. Figure 4.1-3 presents a generalized land use

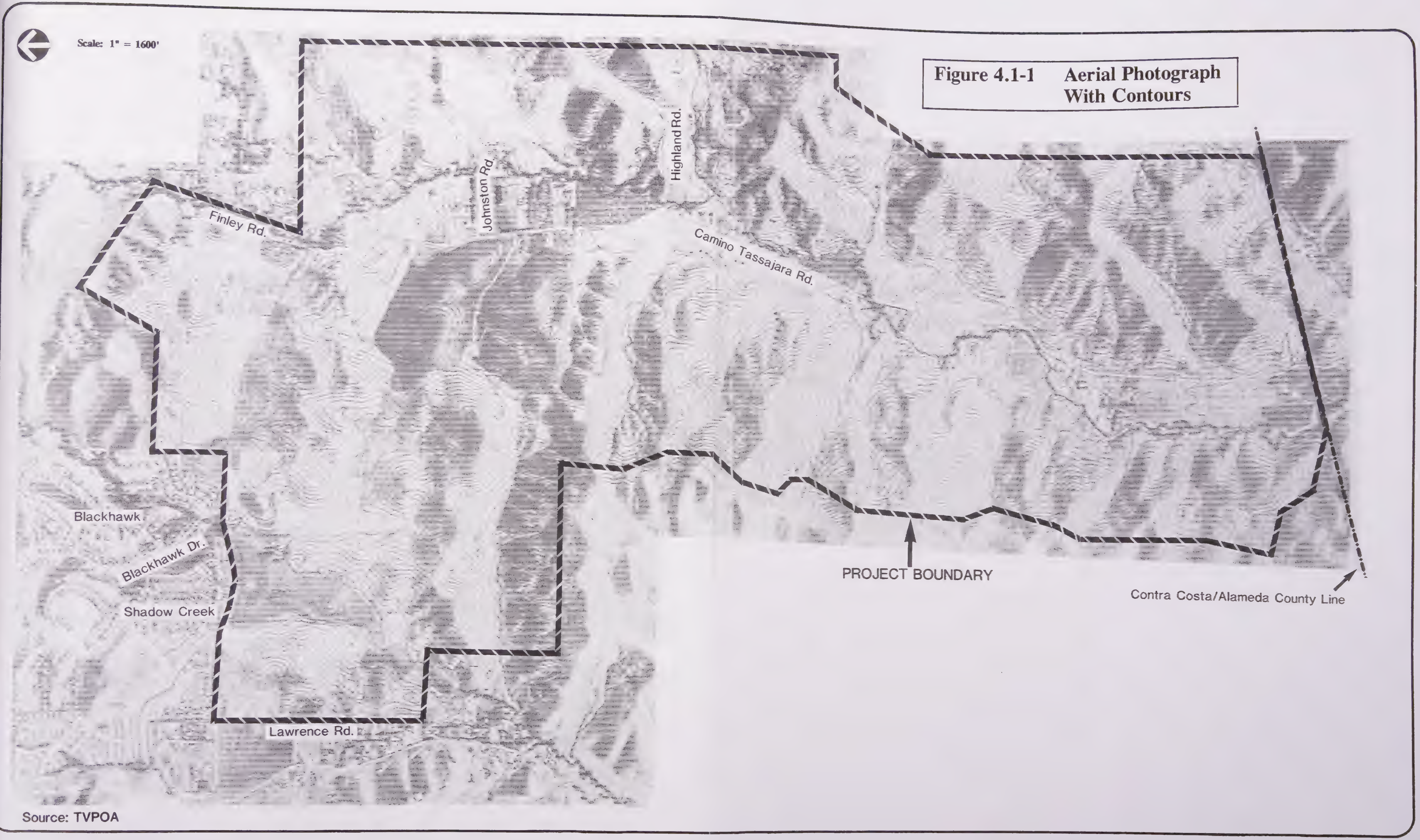


Figure 4.1-1 Aerial Photograph With Contours

Source: TVPOA

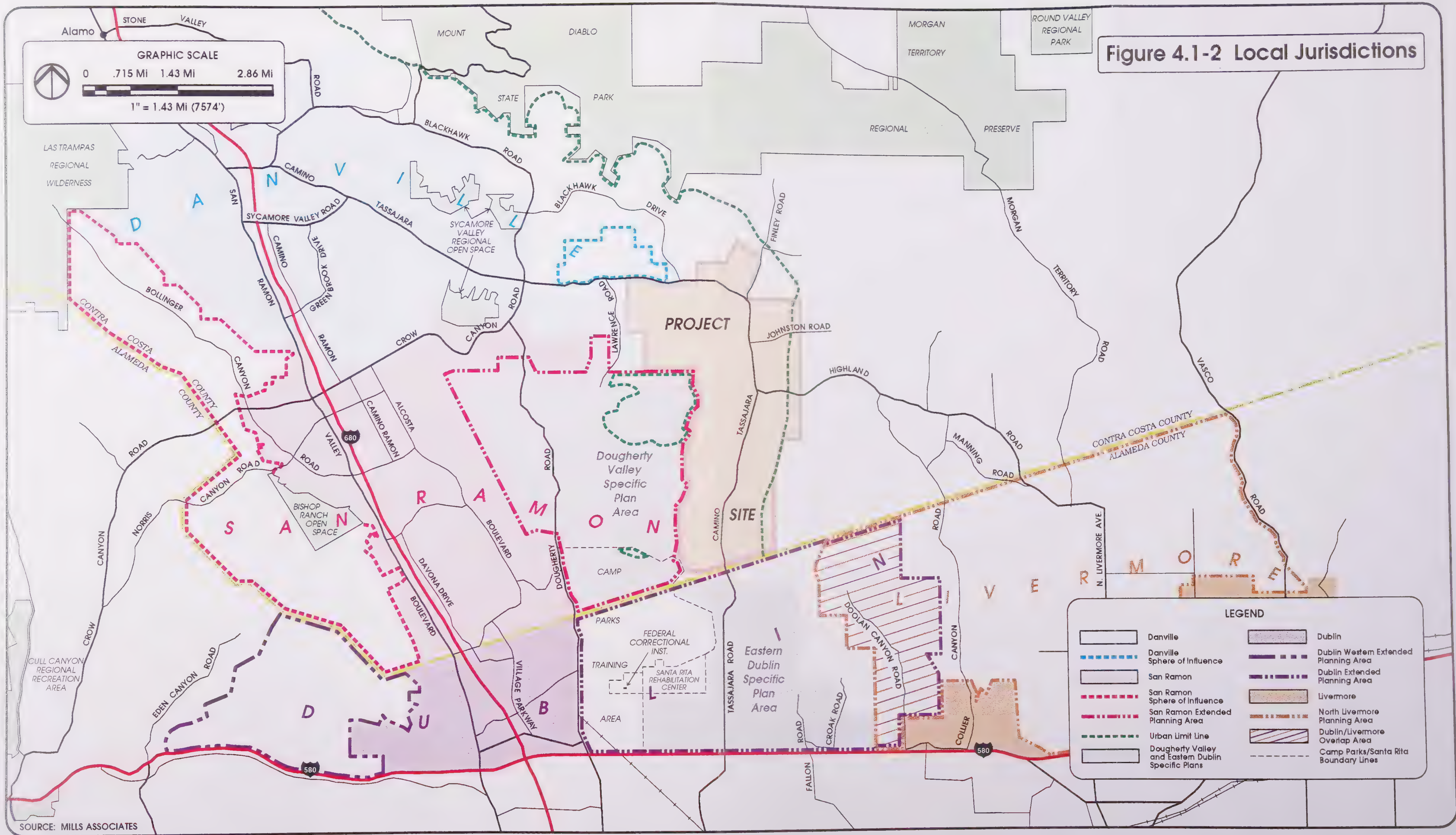


Figure 4.1-2 Local Jurisdictions

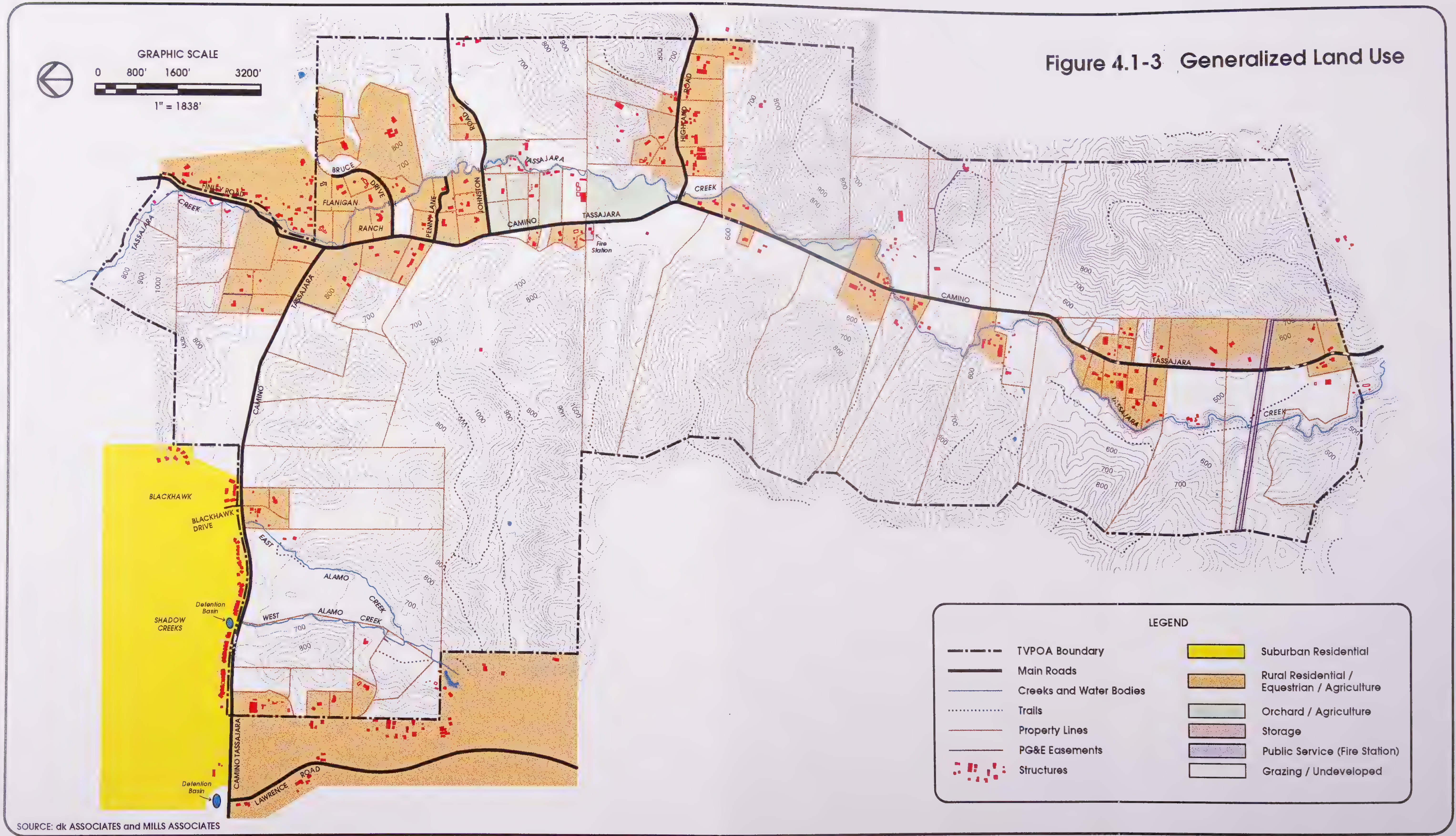


Figure 4.1-3 Generalized Land Use
GRAPHIC SCALE
0 800' 1600' 3200'
1" = 1838'
LEGEND
TVPOA Boundary
Main Roads
Creeks and Water Bodies
Trails
Property Lines
PG&E Easements
Structures
Suburban Residential
Rural Residential / Equestrian / Agriculture
Orchard / Agriculture
Storage
Public Service (Fire Station)
Grazing / Undeveloped
FINLEY ROAD
BRUCE
FLANIGAN
RANCH
DRIVE
PENN LANE
JOHNSTON
ROAD
HIGHLAND ROAD
TASSAJARA
CREEK
CAMINO
Fire Station
BLACKHAWK
BLACKHAWK DRIVE
EAST
ALAMO
CREEK
WEST
Detention Basin
SHADOW CREEKS
CAMINO TASSAJARA
LAWRENCE
ROAD
SOURCE: dk ASSOCIATES and MILLS ASSOCIATES

map of the plan area. Figure 4.1-3 does not attempt to portray land uses on individual parcels, but to show the extent and variety of existing uses. Orchards are located adjacent to Tassajara Creek. Equestrian facilities are located along Camino Tassajara and Highland Road. Ridges and upland areas are devoted to grazing. There are ranch facilities (barns, sheds, water holes, etc.) scattered throughout the plan area.

Large lot residential development of varying density has occurred on the lower hillsides and the valley floor. Residential development is principally located along Tassajara Road, Finley Road, Bruce Drive, Penny Lane, Johnston Road and Highland Road. Approximately 120 single-family units exist within the planning area. Residential development generally consists of very large lots with residences of recent construction. For example, residential parcels located around Finley Road average ten acres in size; residences located near Johnston Road are generally on 5-acre parcels; and residences on Highland Road are on approximately 10-acre parcels. A cluster of 5-acre parcels is located on both sides of Tassajara Road near the southern portion of the plan area.

The San Ramon Valley Fire Protection District's station #36 is located on the west side of Tassajara Road, midway between Johnston Road and Highland Road. Two adjacent and parallel PG&E easements (one 75-foot right-of-way and one 42.5-foot right-of-way) cross the southern portion of the planning area. A single wood pole distribution line is located in the easement.

Agricultural Issues

Tassajara Valley is used primarily for grazing cattle and to a lesser extent to grow oats, wheat, barley and hay which are considered dry field crops. A small portion of land is used for growing walnuts. Due to a lack of irrigation, lands in the Tassajara Valley have limitations for intensive agricultural use.

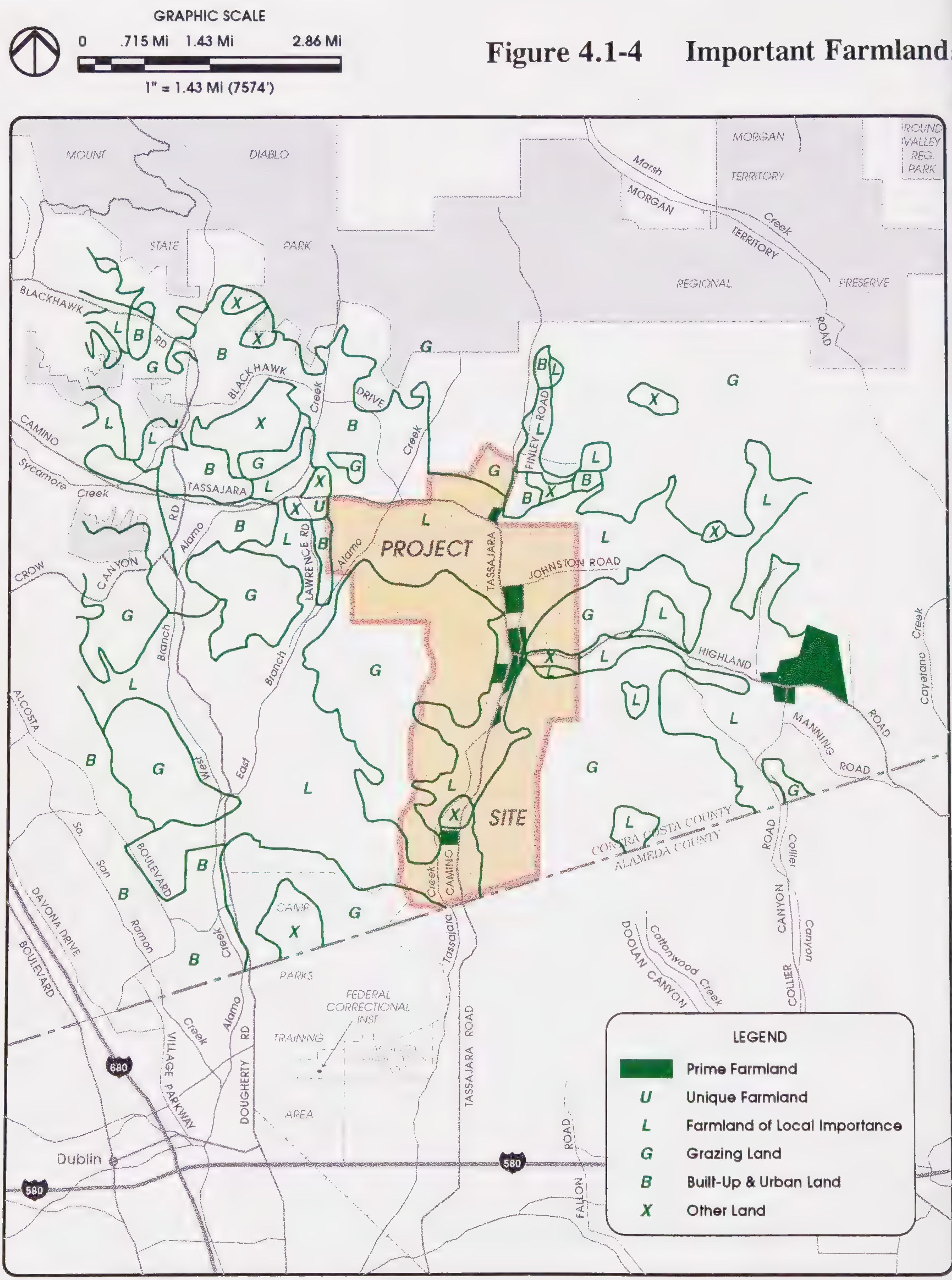
Important Farmlands

According to the California Department of Conservation Important Farmland Map for Contra Costa County, Tassajara Valley is primarily Grazing Land (approximately 2,272 acres; 50 percent of area) and Farmland of Local Importance (approximately 1,750 acres[1]; 39 percent). There are also minor amounts of land designated Prime Farmland (approximately 232 acres; five percent), Unique Farmland (approximately 51 acres; one percent), Urban and Built-Up Land (approximately 5 acres; one-tenth percent), and Other Land (approximately 58 acres; one percent). There is no Farmland of Statewide Importance. The extent of these farmlands in the planning area is presented in Figure 4.1-4 and farmland categories are defined as follows:

P Prime Farmland: Land with the best combination of physical and chemical features for production of agricultural crops.

[1] Excludes acreage for recently approved Wendt Ranch proposal.

Figure 4.1-4 Important Farmlands



SOURCE: California Department of Conservation (July, 1988)

S Farmland of Statewide Importance: Land with a good combination of physical and chemical features for the production of agricultural crops.

U Unique Farmland: Land of lesser quality soils used for the production of the state's leading agricultural cash crops.

L Farmland of Local Importance: Non-irrigated land with prime and state-wide soil mapping units.

G Grazing Land: Land on which the existing vegetation is suited to the grazing of livestock.

B Urban and Built-Up Land: Land occupied by structures or infrastructure to accommodate a building density of at least one unit to one and one-half acres, or approximately six structures to 10 acres.

X Other Land: Land which does not meet the criteria of any other category.

Grazing lands are primarily the upland areas that are too steep to farm efficiently. Valley soils are generally better suited to intensive agriculture yielding the "Farmland of Local Importance" designation. However, lack of sufficient water resources for irrigation keeps most valley land from being rated Prime Farmland or Farmland of Statewide Importance.

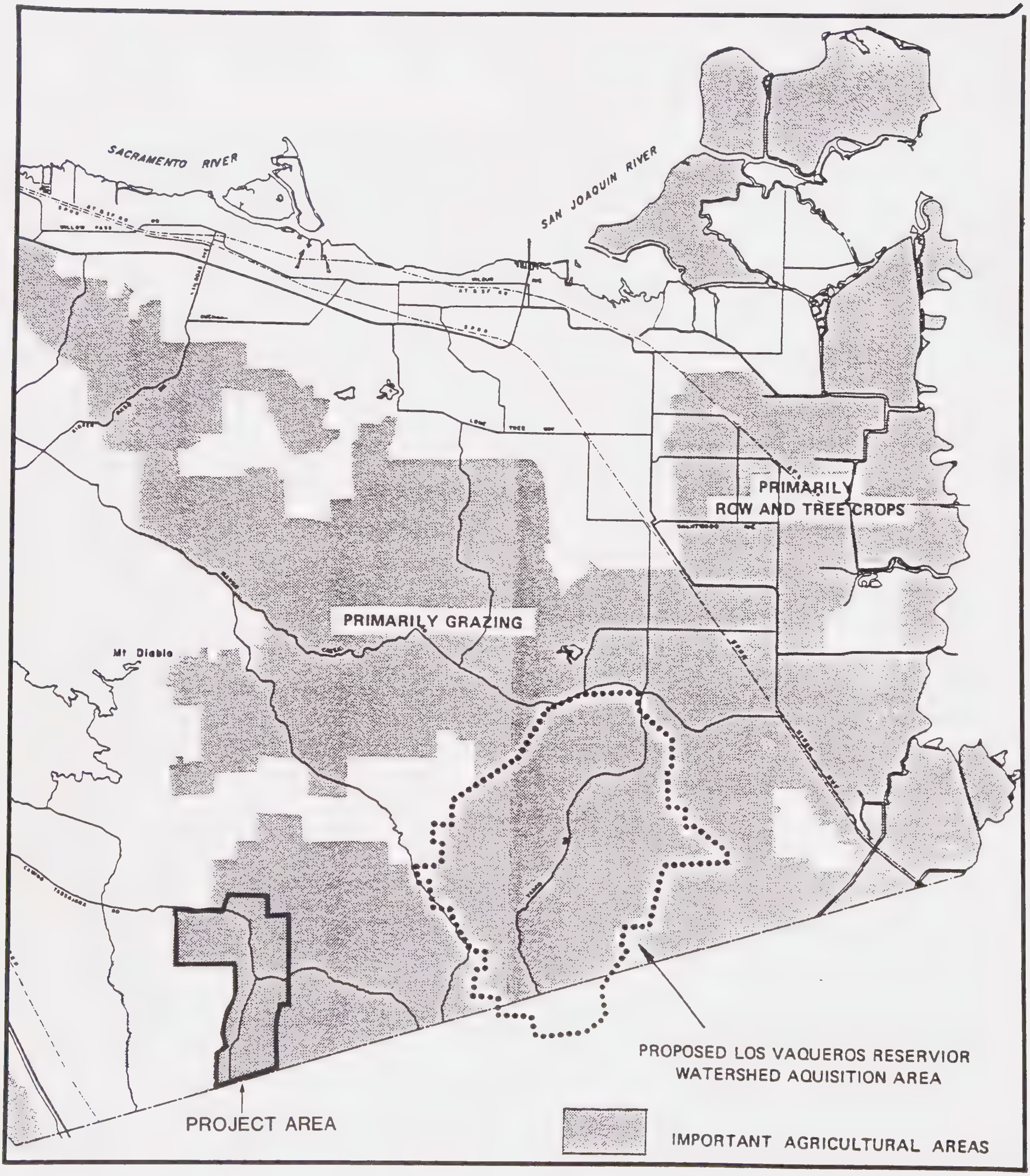
The Tassajara area is considered to be important agricultural land by Contra Costa County (Figure 4.1-5). This area is considered an important resource to be protected because it is one of the most productive grass growing areas in the state. The resource value for grazing is considered to be as important as the economic-creating (jobs and profit) value of agriculture in Tassajara Valley (Barry, 1994).

Grazing Conditions

Each head of cattle requires a minimum of eight to 12 acres to graze year-round, depending upon site conditions and management of the land (Garcia, 1994; Rasmussen, 1994). With regard to the economics of grazing, each animal can gain up to two pounds per day if undisturbed, which is an increase in sale value of about $2 per cow per day. Occasional problems exist with dogs, hikers and mountain bikers trespassing and disturbing cattle. Trespassers and increasing traffic (noise, pollution, occasional accidents) reduce the rate at which weight gain occurs. An encroaching urban area makes ranching less economical because vandalism, trash dumping and trespass increase with proximity to larger populations.

Williamson Act Lands

The State of California and the counties (including Contra Costa) participating in the Williamson Land Conservation Act consider the preservation of agricultural land to be important. The Williamson Act is a state law that attempts to foster voluntary conservation of agricultural land by reducing taxes for agricultural lands to help them remain economically viable. It enables owners of agricultural lands to



Source: Contra Costa County General Plan

Scale: 1" = 16,000' N

FIGURE 4.1-5 CONTRA COSTA COUNTY IMPORTANT AGRICULTURAL LANDS

enter into a Land Conservation Contract with the County. Owners receive property tax rates that are based on the agricultural value of the land, rather than its development potential. In return the property owner agrees to retain the agricultural use for 10 years. The law provides for automatic annual renewal of the contract.

The Williamson Act establishes minimum standards on agricultural preserves. For example, a preserve must be at least 100 acres, but several parcels can be combined to meet this criteria. The state law recommends that the minimum parcel size should not go below 10 acres for prime farmland and 40 acres for non-prime farmland. The County Zoning Ordinance specifies that no new structures are permitted on parcels less than 20 acres within the A-4 (Agricultural Preserve) Zoning District. Within Contra Costa County, most of the land in agricultural preserves is rangeland that is used for grazing livestock and dry land farming, typical of that found in the Tassajara Valley.

The owner of an agricultural preserve can petition for cancellation of the contract. The Williamson Act provides that cancellation of a contract can be granted if the canceling agency (Contra Costa County) makes one of the two following findings:

1. That the cancellation is consistent with the purpose of the Act; or

2. That cancellation is in the public interest.

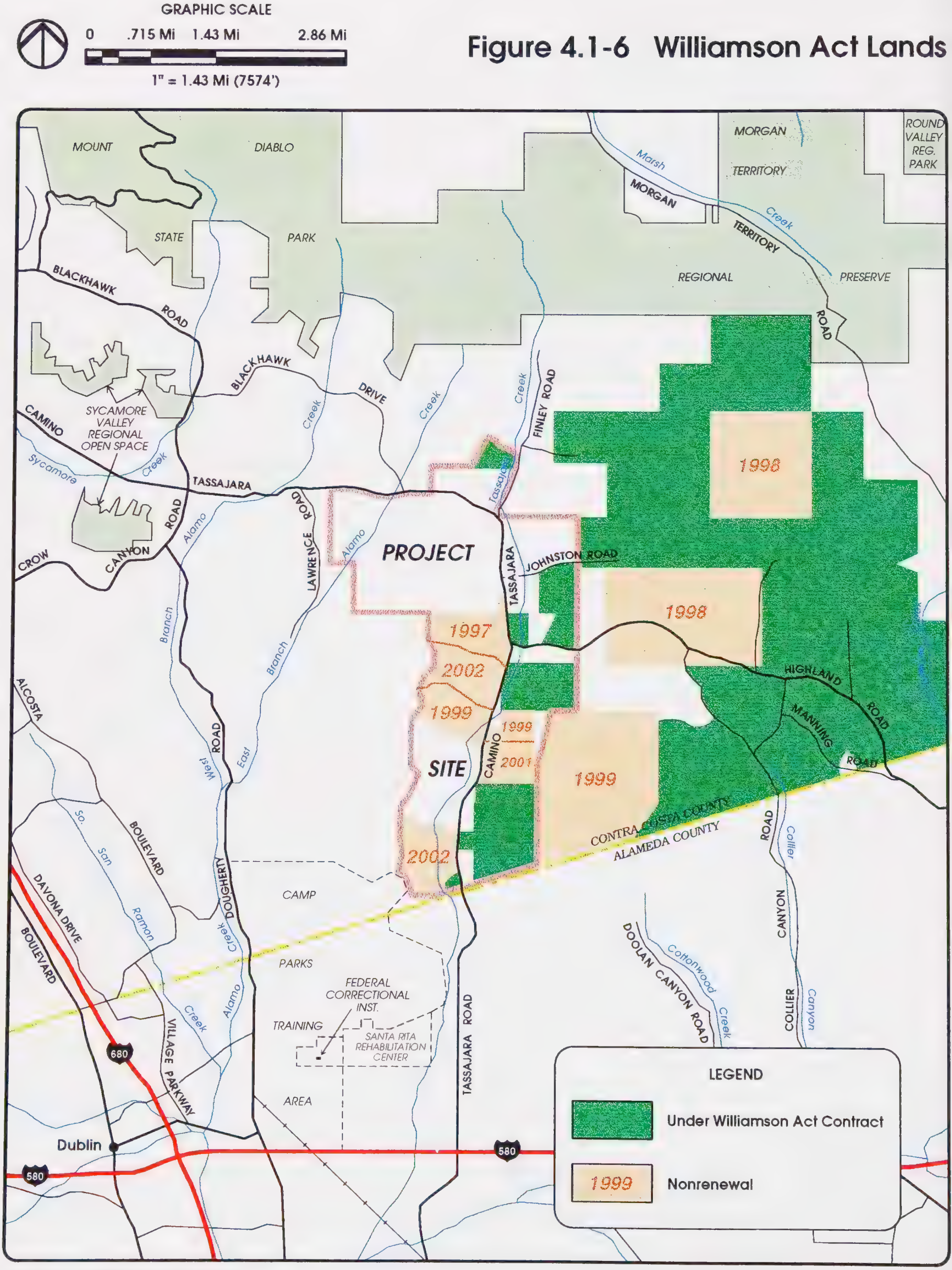
According to the Government Code (Section 51282(b) (1-5)), cancellation is deemed to be consistent with the Williamson Act if all five of the following findings can be made:

(1) a notice of non-renewal has been served;
(2) cancellation is not likely to result in the removal of adjacent lands from agricultural use;
(3) cancellation is for an alternative use which is consistent with the applicable general plan;
(4) cancellation will not result in discontinuous patterns of urban development; and
(5) there is no proximate noncontracted land which is both available and suitable, or, that development of the contracted land would provide more contiguous patterns of urban development.

Figure 4.1-6 shows Williamson Act lands in the Tassajara Valley area. Of the approximately 2,166 acres in agricultural preserve, the owners of 932 acres have filed notices of non-renewal with the County. During 1995, three parcels, totaling 767 acres, went out of the program. Additional contracts will expire between 1997 and 2002. East of the project site and east of the Urban Limit Line, owners of a number of properties under Williamson Act contract have filed for non-renewal. Contracts will expire on four large parcels beginning in 1989-99 (Figure 4.1-6).

In 1981, the County Board of Supervisors approved rezoning of 28,000 acres in the Tassajara area (2218-RZ). This zoning ordinance was enacted to (a) preserve open space for agriculture, and protect it from urban encroachment, and (b) control development in areas having topographic constraints and lack of public services. It represented a response of the County to minor subdivision activity which accelerated throughout the 1960s and 1970s.

Figure 4.1-6 Williamson Act Lands



SOURCE: DARWIN MYERS ASSOCIATES

General Plan and Zoning Designations

General Plan

The *Contra Costa County General Plan* is the County's chief planning document for the area (*General Plan*, 1996). Adopted in August 1996, the plan sets out goals and policies for development throughout the County. The land use policies described in the *General Plan* are implemented by means of the County's Zoning Code, which further defines permitted land uses and development requirements (Code, 1991).

The *General Plan* Land Use map is a part of the *General Plan* Land Use Element and shows the land use designations for all areas of the County. Figure 4.1-7 shows the *General Plan* designations for the planning area and project vicinity.

The entire planning area is designated Agricultural Lands (AL). The AL designation is summarized below:

- Agricultural Lands (AL): This land use designation includes most of the privately owned rural lands in the County excluding private lands that are composed of prime soil, or lands that are located in or near the Delta. Most of these lands are in hilly portions of the County and are used for grazing livestock or dry grain farming. The category also includes non-prime agricultural lands in flat East County areas, such as outside Oakley, which are planted in orchards. The purpose of the Agricultural Lands designation is to preserve and protect lands capable of and generally used for the production of food, fiber, and plant materials (*General Plan*, page 3-33) . . . . The maximum allowable residential density is one dwelling unit per five acres.

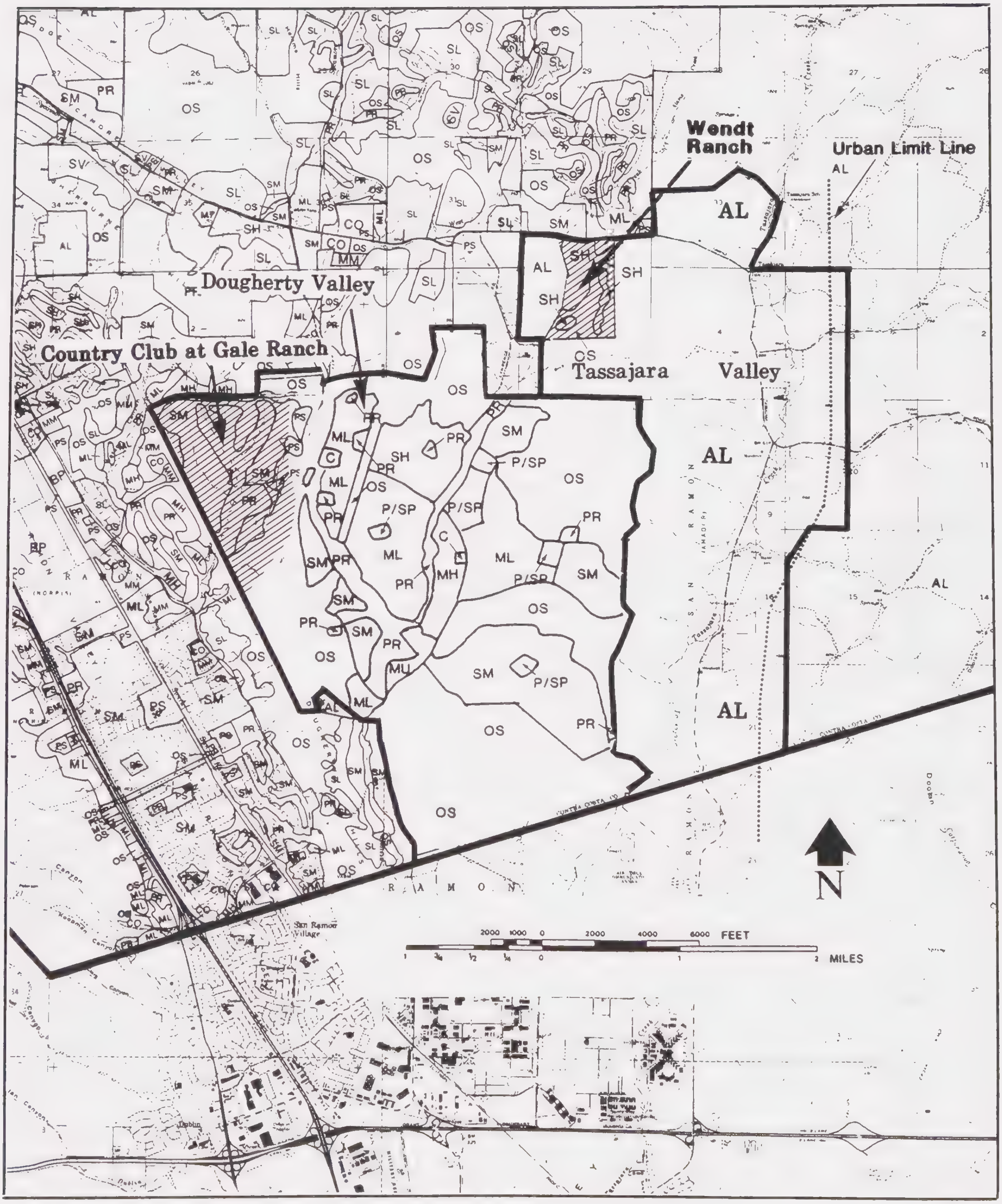
Figure 4.1-7 also shows the *General Plan* designations for areas adjacent to the project area. To the north and east, the planning area is bordered by Agricultural Land (AL). Developed land bordering the site on the northwest carries designations for SL, SM, PS and OS. Portions of Dougherty Valley adjacent to the project area have OS and PR designations. The recently approved Wendt Ranch property has designations of SH, ML and OS. These designations are summarized below.

SL Single-Family Residential Low Density; allows a range of 1.0 to 2.9 single-family units per net acre. Sites can be as large as one acre. Unique environmental characteristics of a parcel may justify larger lot sizes.

SM Single-Family Residential Medium Density; allows between 3.0 and 4.9 single-family units per net acre. Sites can range up to one-third acre.

SH Single-Family Residential High Density; allows between 5.0 and 7.2 single-family units per net acre. Sites can range up to 8,729 square feet.

ML Multiple-Family Residential Low Density; allows a range of 7.3 to 11.9 multi-family units. Sites can be as large as 5,999 square feet.



Source: Contra Costa County

Figure 4.1-7 General Plan Designations - Tassajara Valley and Vicinity

PS Public and Semi-Public; includes properties owned by governmental agencies such as libraries, fire stations, schools, etc.

PR Parks and Recreation; incudes publicly owned city, district, County and regional park facilities, as well as all golf courses, whether publicly or privately owned.

OS Open Space; includes publicly owned, open space lands which are not designated as Public and Semi-Public, Watershed or Parks and Recreation. Lands designated Open Space include, without limitation, wetlands and tidelands and other areas of significant ecological resources or geologic hazards. The Open Space designation also includes privately owned properties for which future development rights have been deeded to a public or private agency.

Dougherty Valley. The Dougherty Valley project area contains 5,978 acres located adjacent to the Tassajara Valley planning area on the west. An unincorporated area of Contra Costa County, Dougherty Valley is bordered by Danville and San Ramon on the north, San Ramon on the west and Dublin on the south (refer to Figure 4.1-2, Local Jurisdictions). Currently undeveloped grazing land, the valley was designated as Agricultural Land on the County's *1991 General Plan* Land Use Map. In December 1992, Contra Costa County certified a Final Environmental Impact Report on the project (EIR, 1992), approved a *General Plan* Amendment and adopted the *Dougherty Valley Specific Plan* (*Plan*, 1992). With approval of the project, the County's *General Plan* Map was redrawn to show the approved land use designations for Dougherty Valley. In August 1995, the developers of Dougherty Valley, Windemere Ranch partners, submitted a General Plan Amendment, Specific Plan Amendment and final development plan to remove the military land from the project area and allow a community college campus within the Windemere Village Center located in the southern portion of the valley near the Windemere Parkway. These amendments and final development plan were approved by the Board of Supervisors on December 17, 1996. Shapell Industries submitted an application in October 1995 for General Plan and Specific Plan amendments and a final development plan for their portion of Dougherty Valley, known as Gale Ranch II. They also received their approval on December 17, 1996. Figure 4.1-7 shows the designations according to the latest *Dougherty Valley General Plan Amendments*.

The Dougherty Valley plan includes 11,000 homes, 680,000 square feet of commercial development, office space, schools (including a branch community college), fire stations and golf courses. Over one-half the project area would be preserved as agricultural, recreational or other open space use. The ultimate population at buildout could be as high as 29,810 persons.

Dougherty Valley Agreement. In May 1994, an agreement was reached between Contra Costa County, the Town of Danville and the City of San Ramon, and the Dougherty Valley developers — Shapell Industries and Windemere Ranch Partners. The purpose of the agreement is to establish the principles for the development of the Dougherty Valley, including standards for the provision of services, infrastructure and facilities. The agreement established a cooperative process by which development will be reviewed, approved, and carried out. It will provide for an orderly development, annexation, operation and maintenance of facilities and infrastructure, and delivery of public services,

in accordance with certain standards that have been agreed to by San Ramon and Danville. The County, San Ramon and the developers have discussed terms which may, subject to adequate funding arrangements, be annexed to San Ramon. As stated by the Board of Supervisors, the settlement agreement does not apply to the Tassajara project.

The parties have determined that, provided certain roadway improvements are in place at the appropriate time, 8,500 dwellings units may be built in the Dougherty Valley without compromising traffic service objectives established by San Ramon and Danville. Permits beyond 8,500 units will not be issued without further traffic analysis to ensure that those traffic service objectives will not be exceeded. This agreement establishes a methodology for monitoring traffic, and remediating exceedences of traffic service objectives during the buildout of the project.

Consistent with this agreement, on December 19, 1995, the County approved: 1) a change in the County's zoning ordinance to include the Dougherty Valley in the County's P-1 zoning district, 2) preliminary development plans for up to 11,000 units in the Dougherty Valley, together with the commercial and other uses and facilities and infrastructure described in the GPA and the Specific Plan, and 3) a development agreement with Windemere and development agreement with Shapell which would govern the development of the Dougherty Valley project, consistent with CEQA, the Specific Plan, rezoning and Preliminary Development Plans.

The Country Club at Gale Ranch. On December 20, 1994, Shapell Industries was granted approval from the Board of Supervisors for a *General Plan* Amendment and rezoning for 618 acres in the northwest corner of Dougherty Valley along Coyote Creek (refer to Figure 4.1-7). The land was rezoned from agricultural use to planned unit development. The development, known as the County Club at Gale Ranch, is a self-contained 1,216 single-family and multi-family residential development surrounding an 18-hole golf course featuring a clubhouse, driving range and related facilities. The project also includes a church site, three neighborhood parks and open space areas. Land uses are consistent with the *Dougherty Valley Specific Plan*.

Wendt Ranch. Since submittal of the TVPOA application and after noticing the general public and agencies, Shapell Industries requested the Contra Costa County Board of Supervisors in November 1995 to allow them to proceed with a development proposal on the Wendt Ranch property separate from the Tassajara project. The Shapell application for a General Plan Amendment and Rezoning was subsequently approved by the Board of Supervisors in December 1996. Identified as the Wendt Ranch development, a separate environmental impact report for this project was certified by the Board of Supervisors in December 1996 (SCH #96013041). The General Plan Map (Figure 4.1-7) and the Zoning Map (Figure 4.1-8) reflect this latest approval.

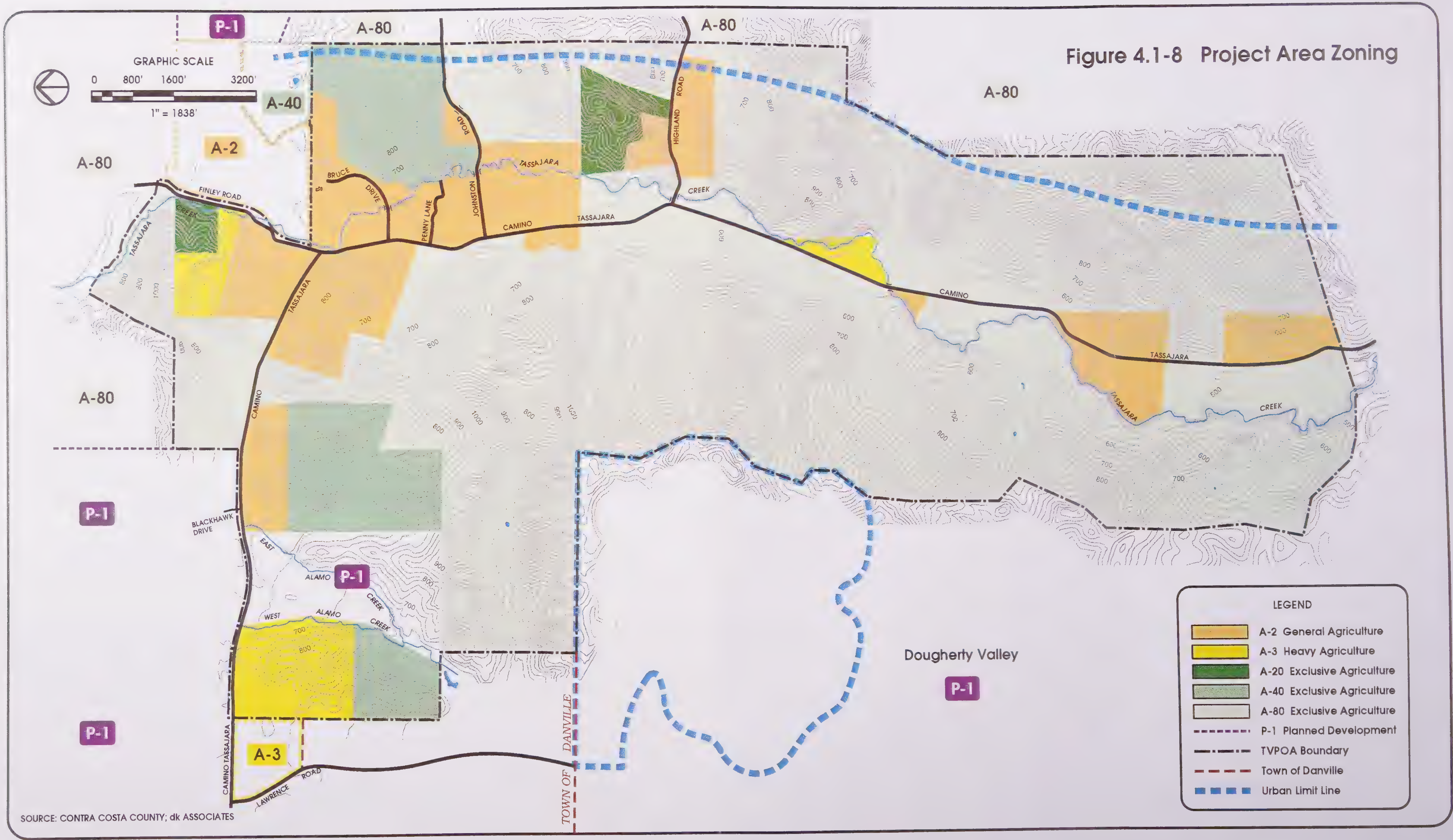


Figure 4.1-8 Project Area Zoning
GRAPHIC SCALE
0 800' 1600' 3200'
1" = 1838'
A-80
P-1
A-40
A-2
FINLEY ROAD
BRUCE DRIVE
PENNY LANE
JOHNSTON ROAD
HIGHLAND ROAD
CAMINO TASSAJARA
TASSAJARA CREEK
BLACKHAWK DRIVE
EAST ALAMO CREEK
WEST ALAMO CREEK
A-3
LAWRENCE ROAD
TOWN OF DANVILLE
Dougherty Valley
LEGEND
A-2 General Agriculture
A-3 Heavy Agriculture
A-20 Exclusive Agriculture
A-40 Exclusive Agriculture
A-80 Exclusive Agriculture
P-1 Planned Development
TVPOA Boundary
Town of Danville
Urban Limit Line
SOURCE: CONTRA COSTA COUNTY; dk ASSOCIATES

Zoning Designations

Excluding the Wendt Ranch development, the project area is currently zoned for agriculture, with designations including A-2, A-3, A-20, A-40 and A-80. Figure 4.1-8 illustrates zoning within the project site. The A-2 and A-3 zoning, which allows smaller parcel size, is concentrated along Camino Tassajara where residential development has taken place. The great majority of the planning area is zoned A-40 and A-80, Exclusive Agriculture. Table 4.1-1 presents the approximate number of acres in each zoning category, the minimum lot size for residential development and the potential number of dwelling units if the planning area developed according to zoning requirements.

TABLE 4.1-1
ZONING DISTRICTS ON-SITE
(Acreage Approximate)

Zoning	District	Approx. Acreage[1]	Minimum Lot Size	Potential No. of Units
A-2	General Agriculture	570	5 ac	114
A-3	Heavy Agriculture	145	10 ac	15
A-20	Exclusive Agriculture	69	20 ac	3
A-40	Exclusive Agriculture	352	40 ac	9
A-80	Exclusive Agriculture	3,198	80 ac	40
	Total	**4,334**		**181**

Note: Does not include acreage outside of planning area.
[1] Excludes Wendt Ranch acreage.

Source: Mills Associates.

Figure 4.1-8 also shows the zoning designations for adjacent areas. Lands to the north, east and west are predominately zoned A-80. Exceptions to this include A-2 and P-1 (Planned Development) zoning adjacent to the planning area on the northeast, Blackhawk (zoned P-1) to the northwest and Wendt Ranch (zoned P-1) in the northwest portion of the planning area.

Planning Policies and Regulations

The Contra Costa County *General Plan* expresses the broad goals and policies and specific implementation measures intended to guide decisions on future growth, development and conservation of resources through the year 2010. The County *General Plan* encompasses several components known

as elements. These include Land Use, Growth Management, Transportation/Circulation, Housing, Public Facilities/Services, Conservation, Open Space, Safety and Noise. State law requires that all parts of the *General Plan* comprise an integrated, internally consistent and compatible statement of policies. Thus, in reviewing a development proposal, it is necessary to review all of these elements. Relevant policies pertaining to land use, growth management and agricultural resources are discussed below. Policies related to vegetation/wildlife resources, geology/soils, drainage and flood control, and public facilities and services are discussed in relevant sections throughout Chapter 4.

The County *General Plan* has been strongly influenced by two voter initiatives that provide a context for County planning and development and have guided the evolution of most of the elements. These measures are provided in their entirety in the *General Plan* and are summarized below.

Measure C

The Contra Costa Transportation Improvement and Growth Management Program (Measure C-1988) established a one-half-cent sales tax to fund comprehensive regional transportation infrastructure improvements, transit service, and trails development to reduce traffic congestion. To receive local street maintenance and improvement funds, local jurisdictions are required to:

- adopt a growth management element;
- adopt traffic level-of-service standards keyed to land use types;
- adopt performance standards for fire, police, parks, sanitary facilities, water, and flood control to be addressed by capital improvement programs;
- adopt a development mitigation program to ensure that new growth pays its share of costs associated with that growth;
- participate in a cooperative planning process to reduce cumulative regional traffic impacts of development;
- develop a five-year capital improvement program to meet or maintain traffic service and performance standards;
- address housing and job opportunities for all income levels; and
- adopt a transportation systems management (TSM) ordinance.

Growth Management

The *General Plan* responds to Measure C (1988) by including a Growth Management Element that sets forth level of service (LOS) requirements and other performance standards required by Measure C and describes how they will be implemented. Additional implementing measures are found in the *General Plan*'s transportation and public facilities element. Growth Management is designed to avoid the impact of new growth by delaying development until facilities and services can be ensured. The operative policies are found in Policies 4-1 and 4-2 which require, before new development is allowed, that 1) the County must be assured that the applicant will be able to provide the infrastructure necessary to meet applicable performance standards; 2) a funding mechanism has been established to provide such infrastructure; and 3) other applicable requirements of the growth management element are satisfied.

Where these assurances are lacking, development will be temporarily deferred until it is ensured that performance standards will be met as development proceeds.

Policy 4-1 requires that the County will adopt mitigation measures to ensure that new development pays its fair share of the cost of police, fire, parks, water, sewer and flood control facilities. The County will only approve projects after finding that one or more of the following conditions are met (Policy 4-m):

(a) Performance standards will be maintained following project occupancy;
(b) Specific mitigation measures required to ensure maintenance of standards are required as conditions of approval;
(c) Capital improvements planned by the service provider will ensure maintenance of standards.

65/35 Land Preservation Standard

The 65/35 Land Preservation Plan (Measure C-1990) became the official policy of the County with respect to the preservation of open space and agricultural lands and the protection of valuable environmental resources such as wildlife, wetlands, hillsides and ridgelines. Measure C was implemented through a comprehensive revision of the *General Plan* published in 1991 and since updated (1996). The 65/35 Land Preservation Plan limits urban development in the County through at least the horizon of the *General Plan* to no more than 35 percent of the land in the County and requires that at least 65 percent of the land in the County be preserved for agriculture, open space, wetlands, parks and other non-urban uses. In order to implement the 65/35 Land Preservation Plan, Measure C-1990 called for creation of an Urban Limit Line to identify the outer boundaries of urban development in the County.

Urban Limit Line

The establishment of the Urban Limit Line (ULL) is an integral part of the *General Plan* Land Use Element. The purpose of the ULL is twofold: (1) to ensure preservation of identified non-urban agricultural, open space and other areas by establishing a line beyond which no urban land uses can be designated during the term of the *General Plan*, and (2) to facilitate the enforcement of the 65/35 Land Preservation Standard.

The fact that a property is located inside the ULL provides no guarantee or implication that it may be developed during the lifetime of the *General Plan*. Development of property within the ULL would be restricted by limitations imposed by the County's Growth Management Program, as well as by other *General Plan* limitations. Moreover, even if land is developed within the Urban Limit Line, a substantial portion of this land shall be retained for non-urban uses such as open space, parks and recreational uses.

As shown in Figure 4.1-2, the urban limit line crosses the eastern-most portion of the planning area, running north to south. In conjunction with the latest General Plan Amendment and Specific Plan Amendment approvals for Dougherty Valley, the urban limit line was amended to reflect removal of two areas within the valley from the urban limit line.

Measure C, 1990, Hillside Protection Policy

This initiative was approved by the voters in November 1990. Among the provisions of Measure C is the protection of open hillsides and significant ridgelines. Specifically, "Development on open hillsides and significant ridgelines throughout the County shall be restricted, and hillsides with a grade of 26 percent or greater shall be protected through implementing zoning measures and other appropriate actions." It is important to point out that this language does not preclude development on slopes exceeding 26 percent. To the contrary, development of the slope could only occur after consideration has been given to the site's limitations and attributes. Various zoning designations can provide flexibility when developing hilly terrain. The P-1 (Planned Unit Development) zone allows for flexibility to site homes on less steep slopes or valley floors. Another approach is to reduce the density as the slope steepens.

Upon passage of Measure C, the hillside protection language was integrated into the following elements of the *General Plan*: Land Use, Conservation, Open Space and Safety. This is reinforced with Implementation Measure 3-d of the Land Use Element whereby development projects should be reviewed "for consistency with land use designations and relevant policies and standards of each Element of the *General Plan*." A discussion of policies related to hillside protection is found in this section as well as in the following sections of this document.

Land Use Element

The Land Use Element incorporates Countywide goals and policies related to the jobs/housing balance, growth management, community identity and urban design, residential uses and business/employment uses. The Land Use Element is organized into six parts. First, existing land uses are described and a general discussion of various land use characteristics for the west, central and east sectors of the County are provided. Second, the projected levels of growth used in the *General Plan* are described. This is followed by a discussion of the Urban Limit Line and the 65/35 Land Preservation Standard. The final three sections of the Land Use Element are the County's land use goals, policies and implementation measures. Individual goals and policies and the project's consistency with them are presented as part of the Impacts and Mitigation Measures segment of this Land Use section. Goals and policies from other elements of the *General Plan* are discussed in following sections of this report.

Local Agency Formation Commission

California law has mandated the establishment of Local Agency Formation Commissions (LAFCO) to administer the incorporation and annexation of cities and special service districts in California. The Contra Costa County LAFCO board represents local county and city governments and special districts and is charged with establishing spheres of influence (SOI) that represent ultimate and logical boundaries for city and service area annexations. In addition, applications to extend city boundaries or services are reviewed by the LAFCO in which the city or service district is located. Before approving boundary changes, the LAFCOs are required to make findings regarding orderly development and the efficient provision of services, logical boundaries and preservation of prime agricultural land from premature development. A plan for the provision of services must be approved for each application that addresses service standards and how these services would be financed.

Services that may be required to annex the project area to their service districts include water, wastewater, lighting, landscaping and open space maintenance, and police services. See Section 4.9, Public Utilities, and 4.10, Public Services, for further discussion of annexation issues.

Government Code 56377 also requires that the Local Agency Formation Commission shall consider the following priorities in reviewing proposals that could lead to the conversion of open space lands to other than open space uses:

- Development of use of land for other than open space uses shall be guided away from existing prime agricultural lands in open space use toward areas containing non-prime agricultural lands, unless that action would not promote the planned, orderly, efficient development of an area.
- Development of existing vacant or non-prime agricultural lands for urban uses within the existing jurisdiction or sphere of influence of a local agency should be encouraged before any proposal is approved which would allow for or lead to the development of existing open space lands for non-open space uses outside the jurisdiction or sphere of influence of the agency.

Adjacent Jurisdictions

The Tassajara planning area lies under the sole jurisdiction of Contra Costa County. However, the Town of Danville, the City of San Ramon and the City of Dublin (Alameda County) share some common boundaries with the planning area. Figure 4.1-2 shows the relationship between the three cities and the TVPOA area.

<u>Danville</u>

The Danville town limit extends south from Camino Tassajara along a portion of the western border of the planning area in the Lawrence/Leema Road district. North of Camino Tassajara, residential development (but not Blackhawk), is within Danville's Sphere of Influence (SOI) (see Figure 4.1-2).

Of the three cities that share common boundaries with the project area, only Danville addresses the Tassajara Valley in its *General Plan*:

> Currently, this area (Tassajara Valley) is not within any adopted sphere of influence and is controlled solely by Contra Costa County. Because of significant impacts which future land use changes in this area could have on the Town of Danville, it is considered to be within the Town's planning area. Because major land holdings will come out of the Williamson Act contract during the life of this general plan, the plan must consider how to approach potential non-agricultural uses. (Danville, 1987.)
>
> A critical element for consideration of further land use changes in the Tassajara and Dougherty Valley area will be allowing time for the previously approved developments to be absorbed in order to more adequately analyze the impact which this development will have on the valley. The Town should work with the affected property owners and other governmental agencies to complete a comprehensive long-range plan for this area. Housing types should focus upon larger lot residential development to balance recent smaller lot and higher density development within the area. Further consideration should be given to the transition of densities from suburban residential to rural ranchettes and the provision of greenbelt areas. (Danville, 1987.)

<u>San Ramon</u>

The City of San Ramon is not contiguous with the Tassajara planning area, but Dougherty Valley adjacent to the planning area on the west is within San Ramon's extended planning area. Future buildout of Dougherty Valley and its potential annexation to San Ramon would establish the existing extended planning boundary as the future city limits of San Ramon along the common north-south boundary. San Ramon has no *General Plan* policies relating to the project area.

<u>Dublin</u>

Alameda County borders the Tassajara planning area on the south. This portion of Alameda County is within Dublin's eastern extended planning area. Dublin recently (1993) approved a specific plan for Eastern Dublin that included the area immediately adjacent to the project site and south of the County line. Eventually, Dublin will annex the Eastern Dublin planning area and the city limits will abut the Tassajara planning area on the south.

<u>East Dublin Specific Plan</u>

The *Eastern Dublin Specific Plan* (EDSP) governs approximately 3,500 acres of land located in Alameda County, just east of the City of Dublin. The plan envisions a self-sustaining community where people live, work, play and interact in a way that fosters a strong sense of community. The EDSP anticipates 12,356 residential units, a population of 32,510, 9.73 million square feet of office and retail

space and 28,000 employees. The one element present in the *Eastern Dublin Specific Plan* and lacking in the proposed project is provision of substantial employment opportunities. Given the proximity to Eastern Dublin, it is conceivable that many Tassajara Valley residents would commute to jobs there. Figure 4.1-9 presents the *Eastern Dublin Specific Plan* land uses adjacent to the Tassajara planning area.

Tassajara Road serves as the primary transportation spine through the Tassajara Valley and the Eastern Dublin planning areas. Presently, it is a two-lane road which, under the EDSP, will become a six-lane arterial. The Eastern Dublin plan emphasizes reliance on a multi-modal transportation system, while also accommodating automobile travel. EDSP plans a transit route extending the entire length of Tassajara Road within its specific plan boundary. To encourage non-automobile travel, the plan designates a Class II bicycle route along the entire length of Tassajara Road, and extending northward, beyond the County line. The EDSP also includes a system of pedestrian trails. One of the important trail links is the Tassajara Creek Trail, which connects an area within Eastern Dublin owned by East Bay Regional Park District. This 25-acre parcel is strategically located along the west side of Tassajara Creek and will serve as a staging area for accessing the local trail system.

Regional Plans and Policies

Several regional plans provide policy direction for development in the planning area.

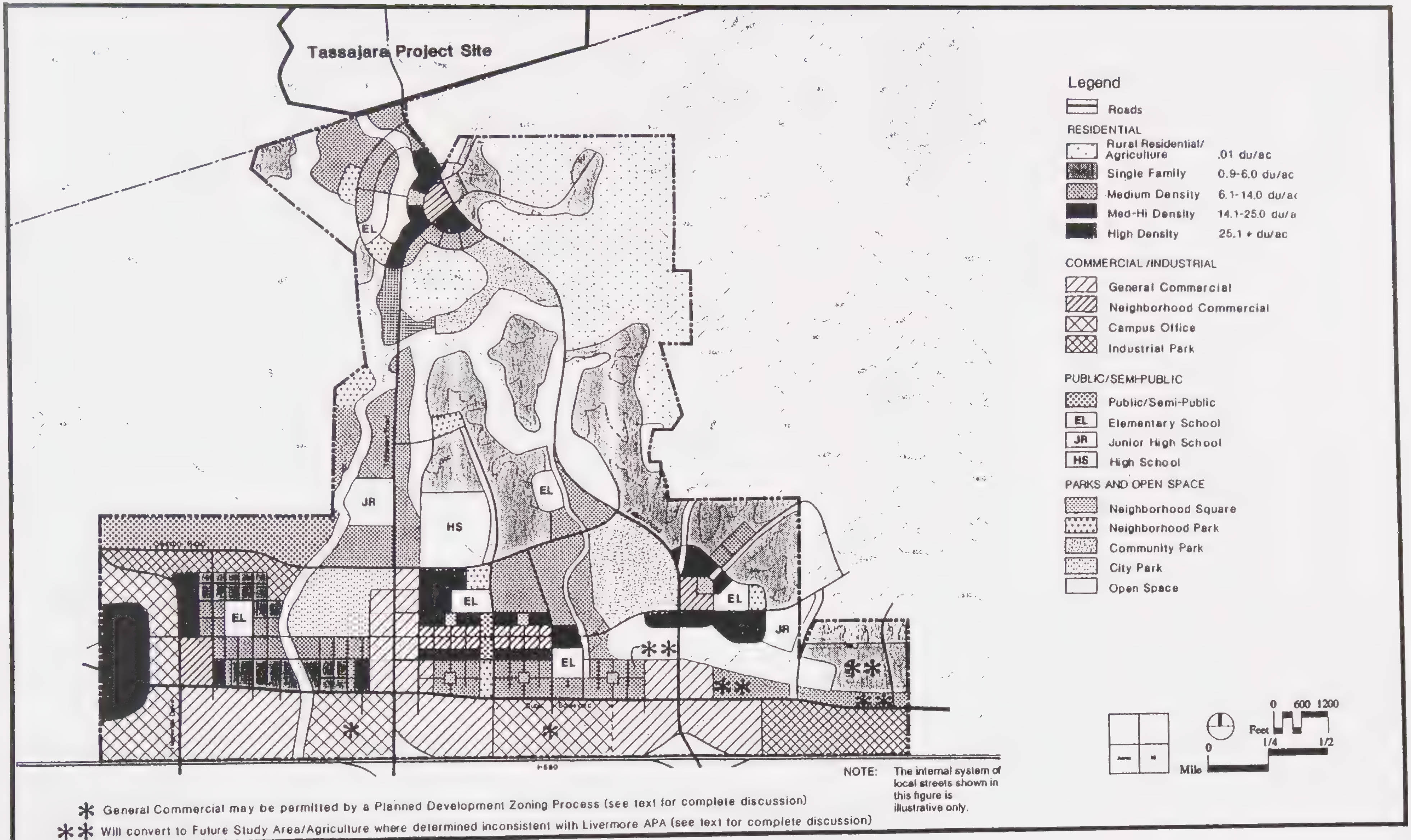
- The East Bay Regional Park District's *Master Plan 1989* provides for regional open space and trails development. The relevant policies of this plan are addressed in Section 4.10, Public Services of this EIR.

- The Metropolitan Transportation Commission (MTC) is responsible for planning for regional transportation and transit in the San Francisco Bay Area. The relevant policies are addressed in Section 4.5, Traffic and Circulation of this EIR. The Contra Costa Transportation Authority administers the Congestion Management Plan (CMP) and Action Plans for Routes of Regional Significance.

- The Bay Area Air Quality Management District (BAAQMD) has released a draft air quality management plan that was prepared in cooperation with the Association of Bay Area Governments (ABAG) and MTC to address attainment of federal and state air quality standards. The relevant policies of the plan area addressed in Section 4.7, Air Quality of this EIR.

- The County has integrated a waste management plan that addresses solid, liquid and hazardous waste treatment and disposal on a countywide basis. This plan is discussed in Section 4.9, Public Utilities of this EIR.

- The San Francisco Bay Regional Water Quality Control Board (RWQCB) administers the National Pollution Discharge Elimination System (NPDES) for the region. This is addressed in Section 4.3, Flood Hazards/Drainage/Water Quality in this EIR.



Source: Eastern Dublin Specific Plan

FIGURE 4.1-9 EASTERN DUBLIN SPECIFIC PLAN LAND USE MAP

IMPACTS AND MITIGATION MEASURES

Significance Criteria

This section uses criteria from Appendix G (Significant Effects) of the State *CEQA Guidelines* and standard professional practice to determine the level of significance of the environmental impact. An impact is considered to be significant if the project would:

- Conflict with adopted environmental plans and goals of the community in which it is located;
- Conflict with adopted *General Plan* goals and policies;
- Convert prime agricultural land to non-agricultural use or impair agricultural productivity of prime agricultural land;
- Conflict with or be incompatible with existing adjacent land use;
- Contribute substantially to adverse cumulative regional land use impacts.

All impacts discussed below are considered to be significant unless identified otherwise. All mitigation measures discussed would reduce the impact identified to a less-than-significant level unless stated otherwise.

Project Consistency with Land Use Goals and Policies

The Land Use Element of the County General Plan contains a variety of goals, policies and implementation measures. The project is consistent with some goals and policies and inconsistent with others. Table 4.1-2 presents goals and policies relevant to the project and a summary of why the project is or is not considered consistent with the policy. Individual impacts relating to land use compatibility, open space, urban design, and conversion of farmland are discussed below along with corresponding mitigation measures.

Impacts relating to jobs/housing, public services and other land use-related issues are found in their respective sections of this report.

Impact 4.1-1 Potential incompatibility with adjacent land uses.

The TVPOA proposed land uses would result in a change in existing land use and may be incompatible with existing and planned adjacent land uses.

TABLE 4.1-2
PROJECT CONSISTENCY WITH GENERAL PLAN LAND USE GOALS AND POLICIES

	Consistency	
Land Use Element Goals: 3-A To coordinate land use with circulation, development of other infrastructure facilities, and protection of agriculture and open space, and to allow growth and the maintenance of the County's quality of life.	Partially consistent	The project is an integrated development with planned circulation and infrastructure improvements. Project retains open space but removes prime agricultural land and farmland of local importance.
3-C To encourage aesthetically and functionally compatible development . . . which reinforces the physical character and desired images of the County.	Consistent	
3-D To provide for a range and distribution of land uses that serve all social and economic segments of the County and its subregions.	Partially consistent	A range and variety of land uses are provided. Lower income housing is not provided.
3-F To permit urban development only in locations of the County within identified outer boundaries of urban development where public service delivery systems that meet applicable performance standards are provided or committed.	Not consistent	See Public Services, Chapter 4.10.
3-J To encourage a development pattern that promotes individuality and unique character of each community in the County.	Yes	
3-M Protect and promote the economic viability of agricultural land.	Not consistent	Removes prime farmland and farmland of local importance.
Growth Management Policies: 3-11 Urban uses shall be expanded only within an Urban Limit Line where conflicts with the agricultural economy will be minimal.	Consistent	Project is within ULL.

Table 4.1-2 *continued*

	Consistency	
3-12 Preservation and buffering of agricultural land should be encouraged as it is critical to maintaining a healthy and competitive agricultural economy and assuring a balance of land uses. Preservation and conservation of open space, wetlands parks, hillsides and ridgelines should be encouraged as it is crucial to preserve the continued availability of unique habitats for wildlife and plants, to protect unique scenery and provide a wide range of recreational opportunities for County residents.	Partially consistent	Project preserves open space, but impacts hillsides, ridgelines and agricultural use. Impacts relating to agricultural buffer, conservation of open space, ridgelines and habitat are discussed in various chapters.
Community Identity and Urban Design: 3-18 Flexibility in the design of projects shall be encouraged in order to enhance scenic qualities and provide for a varied development pattern.	Partially consistent	Project provides flexibility of design and density, but project will have an impact on existing scenic qualities.
• Implementation measure 3-w. Within the Urban Limit Line, maintain visual separations between communities where the opportunity still exists.	Not consistent	Development at both the west and south project area boundaries is immediately adjacent to neighboring communities.
Residential Uses Policies: 3-22 Housing opportunities for all income levels shall be created. Fair affordable housing opportunities should exist for all economic segments of the County.	Not consistent	The project would increase the over supply of units priced for the middle and upper income ranges and increase housing deficit for lower income households. See Jobs/ Population/Housing, Chapter 4.12.
3-23 A diversity of living options shall be permitted while ensuring community compatibility and quality residential development.	Partially consistent	Variety of housing types provided. However, group housing, elderly and low income housing not a substantial part of project.
3-24 Housing opportunities shall be improved through encouragement of distinct styles, desirable amenities, attractive design and enhancement of neighborhood identity.	Consistent	
3-25 Innovation in site planning and design of housing developments shall be encouraged in order to upgrade quality and efficiency of residential living arrangements and to protect the surrounding environment.	Partially consistent	Design issues are innovative, but project would have numerous impacts on surrounding environment.

Table 4.1-2 *continued*

		Consistency	
3-27	Existing residential neighborhoods shall be protected from incompatible land uses and traffic levels exceeding adopted service standards.	Not consistent	Existing development along Lawrence Road, Finley Road, Bruce Drive, Johnston Road and Highland Road will be impacted by project density.
3-28	New residential development shall be accommodated only in areas where it will avoid creating severe unmitigated adverse impacts on the environment and upon the existing community.	Partially consistent	Project involves mass grading, geological, biological, traffic, visual, noise and air quality impacts.
3-29	New housing projects shall be located on stable and secure lands or shall be designed to mitigate adverse or potentially adverse conditions. Residential densities of conventional construction shall generally decrease as the natural slope increases.	Partially consistent	Residential densities decrease as slope increases, but excessive grading required in some areas to stabilize soil.
Business and Employment Uses Policies:			
3-32	Commercial areas of appropriate size and location shall be provided to accommodate the needs of the present and anticipated population in each subregion or community of the County.	Consistent	
3-33	Well-defined commercial areas oriented to community shopping shall be provided in the County.	Partially consistent	Mixed-use areas are provided, but interaction between commercial and residential uses are not well defined.
3-34	Local shopping facilities shall be distributed and spaced at intervals to accommodate the requirements of residential neighborhoods, minimize travel times and reduce energy costs.	Consistent	
3-38	Business and professional office development shall be encouraged in areas designated for commercial land use within shopping areas and where a transitions or buffer use is appropriate between commercial and residential areas.	Consistent	
•	Implementation measure 3-c. Where appropriate, require the dedication of deeded development rights to the County (or cooperate in dedication to other public agencies) for lands to be protected as open space.	Partially consistent	Future ownership and maintenance of open space lands are not currently determined.

Table 4.1-2 *continued*

		Consistency	
	<u>Agricultural Resources Goals</u>		
8-G.	To encourage and enhance agriculture, and to maintain and promote a healthy and competitive agricultural economy.	Not consistent	Project development would eliminate existing agricultural use.
8-I.	To minimize conflicts between agricultural and urban uses.	Not consistent	Extends line of agriculutral/urban conflict.
	<u>Agricultural/Urban Buffers and Conflicts</u>		
8-ai.	Require adequate setbacks for any non-agricultural structures located within or adjacent to cultivated agriculture.	Not consistent	Provision of setbacks not provided.
8-aj.	Where a discretionary development permit is sought within or adjacent to agricultural districts, reduce potential conflicts by creation of a natural or constructed buffer between the agriculture and the urban land use. Such buffers must occur on the parcel for which the discretionary permit is sought.	Not consistent	Buffers not provided in project design.
8-ak.	Where unmitigable conflicts exist between agricultural and residential uses, generally give priority to maintaining the agricultural use.	Not consistent	Project development would remove agricultural uses.

The planning area is currently bordered by existing development only along its northwest quarter, where it lies adjacent to the Lawrence/Leema Road area of Danville and the unincorporated community of Blackhawk. The Dougherty Valley has been proposed for mixed-use development and open space to the west and the *Eastern Dublin Specific Plan* provides for development adjacent to the project area on the south. Agricultural use would continue to the east and northeast. Possible compatibility issues could arise in the following locations, as identified in Figure 4.1-10.

Lawrence/Leema Road - These properties lie adjacent to Danville's Lawrence/Leema Road area that is designated for rural residential development up to one unit per acre (corresponds to Contra Costa County's SV designation) and one to three units per acre. The proposed plan would designate the McLaughlin/Bohn, Howe, Krikorian/Ecker/White and Ibsen properties as SM (3.0 to 4.9 units per acre). The TVPOA proposal would allow greater density and is located on a hillside that physically overlooks the existing Lawrence Road area.

Highland Road - Development planned for Highland Road would extend to the Urban Limit Line and be designated SM (3.0 to 4.9 units per acre). This area includes the Richards, McMullan, D'Elia and portions of the Rasmussen property. The *General Plan* calls for buffering development where it encroaches on agricultural use. Higher density development creates a correspondingly higher probability of urban/agriculture conflicts. Lower density development also creates a "feathering" effect to make a smoother transition between urban and rural uses.

Brown Property - Development planned for the Brown property would extend to the Urban Limit Line and be designated SM (3.0 to 4.9 units per acre). The *General Plan* calls for buffering development where it encroaches on agricultural use. Lower density development also creates a "feathering" effect to make a smoother transition between urban and rural uses.

Blackhawk - Land use compatibility issues may arise for residents of Blackhawk, particularly residents who live near or utilize the east gate entrance. This entry is located directly across Camino Tassajara from the proposed northern mixed use village. Residents exiting Blackhawk would have a direct view into the center. The proposed height limits of the structures within the MU designation would present an imposing view, particularly if the buildings are sited to face into the project and the rear elevation is exposed. The commercial center also brings about other compatibility issues associated with noise and light and glare, particularly at night.

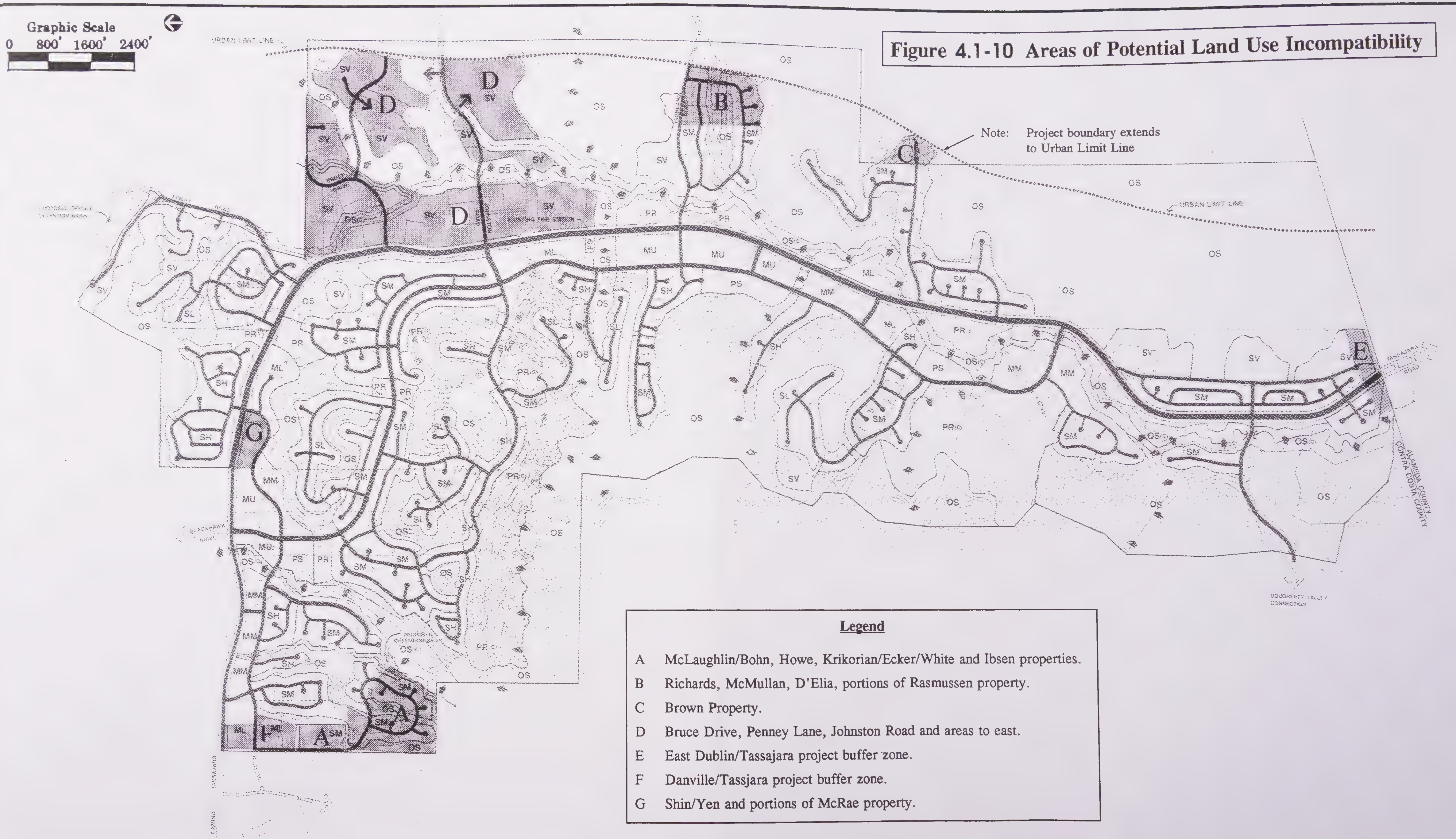
Mitigation Measures

All of the following mitigation measures are required to reduce the impact to a less-than-significant level.

4.1-1(a) *The proposed SM designation should be reduced to SV designation on the McLaughlin/Bohn, Howe, Krikorian/Ecker/White and Ibsen properties.*

4.1-1(b) *Density proposed at the eastern end of the Highland Road development should be reduced from SM to SL or SV. This area includes the Richards, McMullan, D'Elia and portions of the Rasmussen property.*

Figure 4.1-10 Areas of Potential Land Use Incompatibility



Legend

A	McLaughlin/Bohn, Howe, Krikorian/Ecker/White and Ibsen properties.
B	Richards, McMullan, D'Elia, portions of Rasmussen property.
C	Brown Property.
D	Bruce Drive, Penney Lane, Johnston Road and areas to east.
E	East Dublin/Tassajara project buffer zone.
F	Danville/Tassjara project buffer zone.
G	Shin/Yen and portions of McRae property.

Source: Mills Associates

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4.1-1(c) *Density should be reduced in the area adjacent to the urban limit line from SM to SL or SV.*

4.1-1(d) *The Design Guidelines should be revised to include the following design measures to reduce potential land use compatibility problems in the area of the Blackhawk east gate:*

- *Limit development in the northern village center to two stories in height;*
- *Implement design guidelines relative to setbacks and architectural treatment;*
- *Site commercial structures so front elevation faces Camino Tassajara and Blackhawk;*
- *Establish parking areas behind the buildings to reduce the number of street lights in view of Blackhawk; and*
- *Use only downward pointed street lamps to avoid light trespass and glare.*

Impact 4.1-2 Redesignation of Bruce Drive, Penny Lane, Johnston Road and area adjacent on the east to SV could lead to an intensification of development and a disruption of existing land use.

Previous development in the Bruce Drive, Penny Lane and Johnston Road area has created a group of parcels consistent with the existing A-2 zoning, 5-acre minimum (Figure 4.1-10). The TVPOA plan designates this area as SV, Single-Family Very Low Density (0.2 to 0.9 units per acre). Although SV is a very low density by suburban standards, it is still greater than existing zoning except for at the very lowest end of the allowed density range (0.2 units per acre). If the existing residences are not protected by well-written Covenants, Codes and Restrictions (CC&Rs), they may eventually redevelop at the greater SV density. This would alter the existing sense of open space and could create a series of minor subdivisions as 5-acre parcels redeveloped. The land to the east is presently unsubdivided. This area should also be redesignated in the Tassajara plan to ensure a consistent policy in the area.

<u>Mitigation Measure</u>

4.1-2 *The existing Agricultural Lands (AL) designation and agricultural zoning on Bruce Drive, Penny Lane and Johnston Road subarea should be maintained to ensure that rural residential and agricultural uses are continued.*

Impact 4.1-3 The Tassajara plan does not provide a compatible interface with adjacent communities.

There would be a sharp distinction between the types of residential uses planned at the interface of the Tassajara plan and the East Dublin Specific Area Plan. The Tassajara plan designates low density single-family uses with a range of 3.0 to 4.9 units to the acre. The East Dublin Specific Plan proposes multi-family density on the adjacent lands, with a range of 6.1 to 14 dwelling units to the acre. The two plans envision a very different type of residential character and the transition between the two could be abrupt.

Based on the proposed Tassajara plan, there would be minimal open space buffers between Tassajara Valley development and Eastern Dublin development as viewed from Tassajara Road. Travelling north from the upper portion of Eastern Dublin on Tassajara Road, one would experience almost continuous residential development. The Eastern Dublin plan retains some undeveloped open space (outside the East Dublin Specific Plan Area) on the eastern side of Tassajara Road but this pattern is not continued on the west side nor is it continued in the Tassajara plan.

Implementation Measure 3-2 states that "Within the Urban Limit Line, maintain visual separations between communities where the opportunity exists." To address this issue, the Tassajara plan could be adjusted in this area to expand the use of open space buffers and landscaping which would soften the transition between the two types of residential uses and provide a distinction between the communities. The Tassajara Design Guidelines state that community entries should be designed for maximum impact when viewed from a car travelling at arterial speeds. The Guidelines refer to visual landmarks, special materials and setbacks for community entries. However, no specific entry designs are provided.

Similar issues are involved at the Tassajara plan's interface with Danville on the project's west boundary. Multi-Family Low Density residential development (ML) is planned here. Danville has designated the area along Lawrence Road for single-family development. The Corrie property adjacent to the Tassajara boundary is applying for development as single-family homes. Provision should be made to make an entry to the Tassajara community involving setbacks, landscaping and distinctive architecture.

<u>Mitigation Measures</u>

All of the following mitigation measures are required to reduce the impact to a less-than-significant level.

4.1-3(a) *The use of open space buffers and landscaping should be expanded along the plan area's southern boundary with the East Dublin Specific Plan and the project's west boundary with Danville. Open space should extend north from the County line a minimum of 500 feet to create a distinction between communities (Figure 4.1-10).*

4.1-3(b) *Dublin should be urged to require a buffer zone in Alameda County that would help in the transition between the two jurisdictions.*

4.1-3(c) *The use of open space buffers, landscaping and distinctive architecture should be expanded at the project's western boundary.*

4.1-3(d) *The Tassajara Design Guidelines should be modified to include specific entry designs for Camino Tassajara at the County line and at the project's western boundary.*

Impact 4.1-4 Internal land use compatibility problems may arise where housing is sited adjacent to commercial and park/recreational facilities.

Commercial activities bring about a set of problems that include noise, particularly engine noise from delivery trucks and banging of truck doors when unloading merchandise; speaker boxes at drive-through fast food restaurants, equipment noise, loud voices and general vehicular noise. Recreational playing fields primarily generate loud noise relating to voices and traffic, unless properly attenuated.

Restricting playing activities to daylight hours would help attenuate noise levels since the higher background noise levels help to absorb specific noise sources. If sports lighting is permitted, extending playing hours to 10 or 11 p.m., the noise levels could exceed County outdoor nighttime standards. This could impact residents who have a direct line of sight of the playing fields.

Mitigation Measures

The following mitigation measures are required to reduce the impact to a less-than-significant level.

4.1-4(a) *Adequate buffers between commercial and residential land uses should be provided to effectively reduce exterior noise levels to County standards. Noise sources, such as loudspeakers or menu boards, should be directed away from residential areas, equipment noise should be buffered and deliveries should be restricted to daytime hours.*

4.1-4(b) *Recreational activities should be restricted to daylight hours. If the demand for playing fields increases to the point where lights are considered, thereby extending playing time, a noise and lighting study should be conducted to determine the impact to adjoining residents. Appropriate mitigation measures, such as lighting only fields that are located farthest from residences, could be a consideration.*

Impact 4.1-5 The proposed Mixed Use (MU) designation may contain an oversupply of commercial space. This is a less-than-significant impact.

The *General Plan* makes provision for mixed-use areas in two locations. "The purpose of the mixed-use designation is to provide for the integration in a single project of both residential and commercial/office uses. In the mixed-use category housing is specifically permitted but not required" (Plan, 1996). The Tassajara PUD Plan identifies 68 acres of the project area in two locations as mixed-use (MU).

The Tassajara Design Guidelines state that non-residential land uses should be consistent with the County's C-B zoning district. The County's C-B (Commercial -Business) zoning district is a broad category that allows a wide variety of commercial and office uses.

The village center is split into two components; one to capitalize on a site near Blackhawk Drive and one on Highland Road. The PUD plan and the Design Guidelines assume that market forces will determine where different uses locate. This approach could diffuse the "village center" concept.

The Tassajara proposal reserves up to 300,000 square feet of commercial development for the MU districts (171,930 square feet at Highland Center; 128,070 square feet at North Center). This commercial space would be in addition to established commercial centers to the west along Camino Tassajara and 250,000 square feet of commercial space planned in the East Dublin Specific Plan. Over-reliance on commercial development in the two Tassajara Village Centers could delay the centers' growth and cohesiveness. Consideration should be given to converting the northern portion of the Blackhawk Drive MU district (Shin/Yen and McRae properties) to either ML or MM multi-family residential use. (See Figure 4.1-10.)

<u>Mitigation Measure</u>

No mitigation measure is recommended or required.

The following recommendations should be considered as a condition of project approval:

- A detailed Final Development Plan for both MU districts could be completed before individual development projects are approved.

- The Final Development Plan could provide an analysis to demonstrate whether the proposed square footage of the MU commercial space can be absorbed within the Tassajara planning area and the region. If the market study cannot support the proposed commercial square footage, mixed use areas should be redesignated for other uses.

- Consideration could be given to converting the northern portion of the north MU district (Shin/Yen and portions of McRae properties) to ML or MM multi-family residential use or PS public/semi-public use. (See Figure 4.1-10.)

Impact 4.1-6 **The Tassajara plan makes numerous references to the village area having a community focus, but does not provide for community activities such as libraries, churches, etc. This is a less-than-significant impact.**

The Tassajara plan makes many references to the "community" and speaks of the MU districts as village centers and community centers. The plan provides land for public uses such as schools, a fire station, and parks and recreation activities. It is implied that the MU districts will provide other community activities as part of the mixed use areas. The *Design Guidelines* and PUD plan do not provide for community uses that are not public services. The MU districts seem to emphasize retail, commercial and residential uses without regard to the various public, private or quasi-private uses that are important to the sense of community. A church, a YMCA or a meeting hall are examples of private uses that serve a larger public purpose.

Mitigation Measure

No mitigation measure is recommended or required.

The following recommendation should be considered as a condition of project approval:

- The Design Guidelines for the MU districts could be revised to address the need for noncommercial, community uses.

Impact 4.1-7 The Tassajara plan does not adequately address the long-term management and maintenance of open space in the plan area.

The Tassajara plan retains 2,646 acres of land in the plan area as open space. This open space would include park and recreation sites, golf course, a regional trail, hiking and equestrian trails, detention ponds, steam corridors and undeveloped open space. The parks, trails and active recreation uses are discussed in the Parks and Recreation section of the Public Services chapter (4.10) of this report. A discussion of detention basins and creek channels and related maintenance issues is presented in Chapter 4.3, Flood Hazards/Drainage/Water Quality.

A substantial portion of the site, 2,245 acres, would be preserved as undeveloped open space. Much of this open space is located along slopes which are not conducive to development and is interspersed with areas of residential development that extend into the open space areas. This intermingling of open space and developed areas makes maintenance of the open space important, particularly in terms of fire safety.

The Open Space Management portion of the Tassajara PUD Plan states that a major objective of the plan is minimizing disturbance to vegetation, wildlife and wildlife habitats in open space. Five management guidelines are provided. The PUD Plan also states that a prime concern will be maximizing the benefits of grazing in open space and minimizing the impacts of grazing to wildlife values, fire safety, erosion control and watershed management. These goals may represent conflicting objectives and may be mutually exclusive. Maximizing grazing is often detrimental to wildlife habitat, stream quality and erosion control.

The Tassajara PUD plan (PUD, 1995) speculates that the open space could be managed and maintained by one of the following: East Bay Regional Park District (EBRPD), a new community services district, private ownership, the Flood Control District or a combination thereof. There is a possibility that the EBRPD may consent to manage the regional trail and larger open space areas related to it. The Flood Control District may choose to maintain creek channels. There is also the possibility that the proposed Geologic Hazard Abatement District may undertake open space management. However, a substantial portion of the undeveloped open space land is located in smaller segments near residential developments that may not be conducive to agency management.

Mitigation Measures

The following mitigation measures are required to reduce the impact to a less-than-significant level.

4.1-7(a) *The Tassajara Preliminary Development Plan should be revised to designate open space areas as either "public open space" or "private" open space.*

4.1-7(b) *Prior to final approval of any plan for development in the Tassajara Valley or portion thereof, an agency or agencies should be designated and funded to manage and maintain all land designated as "public" open space. Landscape, maintenance and access guidelines should be developed and required for all "private" open space areas.*

Impact 4.1-8 Conversion of approximately 232 acres of prime farmland to urban and park and recreation uses. This would be a significant unavoidable impact.

Implementing the project would convert approximately 232 acres of prime farmland to urban and park and recreation uses. In addition, approximately 1,750 acres of farmland of local importance and 2,272 acres of grazing land would also be converted to urban or urban-related uses. The 4,254 acres of land in these categories is considered important farmland by the California Department of Conservation. The project area is also considered an important agricultural area by Contra Costa County. Though public agencies administering open space may permit some limited grazing to occur, given the nature of the Preliminary Development Plan, with residential development interspersed with open space, and wildlife corridors, the practical potential for grazing on-site is very low. Continued grazing is unlikely to occur on the project's west side due to the fragmented nature of the open space. Some grazing may continue in the southeast portion of the project site. For the most part, however, agricultural production in the Tassajara Valley would essentially be terminated.

The *General Plan* contains many policies that identify the need to protect and preserve agricultural lands. Goal 8-G is "To encourage and enhance agriculture, and to maintain and promote a healthy and competitive agricultural economy." Policy 8-29 is "Large contiguous areas of the County should be encouraged to remain in agricultural production, as long as economically viable. There is no mitigation measure available for this impact. This would be a significant unavoidable impact.

Mitigation Measure

4.1-8 *No mitigation measure is available.*

Impact 4.1-9 The proposed development does not provide an adequate buffer zone for the agricultural land to the east.

According to the *General Plan*, preservation and buffering of agricultural land should be encouraged because it is critical to maintaining a healthy and competitive agricultural economy and assuring a balance of land uses (Policy 3-12). It is the responsibility of the urban area to provide adequate buffers between agricultural use and residential uses, control domestic pets, keep plant diseases and bush and tree seeds from blowing from residential landscaping to agricultural areas, and institute programs to protect agricultural land from trespass and vandals. The proposed plan places residential areas of substantial density adjacent to agricultural land along the ULL.

Policy 8-aj of the Conservation Element states "where a discretionary development permit is sought within or adjacent to agricultural districts, reduce potential conflicts by creation of a natural or constructed buffer between the agricultural and urban land use. Such buffers must occur on the parcel for which the discretionary permit is sought." Neither CEQA nor the *General Plan* state what an adequate buffer is, but since dogs are the most common threat to livestock, a pig-wire fence connected to hard rock or concrete (so dogs cannot dig under it) set at least 200 feet from the ULL would be sufficient.

Mitigation Measures

The following mitigation measures are required to reduce the impact to a less-than-significant level.

4.1-9(a) *The density of any development bordering agricultural land that is adjacent to the ULL should be decreased. This would include density reductions along Highland Road (from SM to SV within 200 feet of the ULL) and on the Brown property (from SM to SV). (Shown on Figure 4.1-10.) Density allowed should be near the lower SV range (0.2 to 0.9 dwelling units per net acre), not more than 0.5. Proposed P-1 zoning would allow this density to be clustered away from the ULL boundary.*

4.1-9(b) *Fencing and berming standards should be included in the Design Guidelines and Development Standards for new development bordering adjacent agricultural lands. Additionally, a 200-foot-wide buffer should be provided west of the ULL.*

Impact 4.1-10 Development of the Tassajara Valley could transfer development pressure to areas further to the east and endanger the loss of additional agricultural land.

Development of the Tassajara planning area will transfer the stress of urban encroachment from the Tassajara Valley to agricultural areas to the east. Historically, real estate values increase as urban development approaches (Jones and Stokes, 1991). The agricultural areas closest to the cities receive the most urban stress resulting in lower productivity, but have the highest development value. This results in pressure for conversion of existing agricultural land to urban uses. This in turn extends development pressure into new areas. Thus, approval of Tassajara Valley development will provide pressure to convert adjacent agricultural land to the east. Owners of four properties east of the project site and east of the Urban Limit Line have filed for non-renewal of Williamson Act contracts as of 1995.

Currently, the Urban Limit Line reduces development pressure to the east of the ULL. The ULL was adopted by the voters and subsequently by the Board of Supervisors to ensure preservation of identified non-urban agricultural, open space and other areas by establishing a line beyond which no urban land uses can be designated during the term of the General Plan. As a result, no urban development can occur east of the ULL until 2010 unless the ULL is changed by a four-fifths vote of the Board of Supervisors and specific findings are made. The Tassajara development is scheduled to build out by 2010, at which time current provisions for the ULL will expire. Without a mechanism to preserve existing agricultural land east of the ULL, the pressure to develop lands east of the ULL could occur.

The County Board of Supervisors has recommended that an Agricultural Soils Land Trust be created for purposes of protecting prime productive soils. An agricultural mitigation fee (or in-lieu fee) could be developed to help in the creation of such an entity which would secure land for long-term agricultural uses. County staff is currently working on developing the Land Trust.

Mitigation Measure

4.1-10 Developers should pay a fee to an Agricultural Soils Land Trust prior to approval of individual tentative maps. This fee is to be used for the purchase of the development rights from the owners of farmlands east of the ULL. This fee could be based on the amount of acreage in cultivation or grazing use in 1996.

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4.2 GEOLOGY/SEISMICITY/SOILS

INTRODUCTION

Previous Investigation

Engeo, Inc. performed an initial investigation of the site and documented their findings in a report dated 22 March 1993. Their scope of work included literature review, photointerpretation of the entire project area and subsurface exploration of selected sites. The subsurface exploration included the logging of 36 test pits and 49 test borings.

The stated purpose of the investigation was to provide sufficient data to make a preliminary assessment of geologic and seismic geological hazards; provide general recommendations and criteria for site grading, drainage and foundation design; and provide geologic and geotechnical input into the constraints analysis which preceded formulation of the *Preliminary Development Plan*. The report states that the recommendations are only suitable for use as a project planning tool. Specific standards and criteria for construction projects will require supplemental geotechnical studies, which will be performed in conjunction with the processing of subdivision applications.

The County Ordinance Code (Title 9, Article 94-2.204(A); 94-2.206(2A); 94-4.224; 94-4.420) makes provision for triggering geologic, seismic and geotechnical reports during the subdivision review process. Specifically, they enable the County to require investigations to evaluate potential geologic, seismic and geotechnical hazards, and provide general recommendations and criteria for site grading, drainage and foundation design.

The County Grading Ordinance also makes provisions for requiring additional geologic and geotechnical studies during the processing of grading and building permits (Building Regulations, Division 716, Articles 716-4.802 through -4.806). Consequently, Engeo's approach of phased studies is consistent with adopted county regulations. The geologic issues to be resolved by the pending application are chiefly land use, density and the grading concept for the project. Construction details are not needed at this time.

Published Mapping

The project site and adjacent region have been mapped by geologists of the U.S. Geological Survey (USGS) and the California Division of Mines and Geology (CDMG). The products of the USGS mapping include bedrock geology maps and photointerpretative landslide maps (Graymer, et al, 1994; Dibblee, 1980; Nilsen, 1975; Brabb, 1971). The CDMG prepared bedrock geology, landslide, debris flow susceptibility and landslide susceptibility maps (Davenport, 1986; Majmundar, 1992). The CDMG investigation used the USGS maps as a point of departure for its study, and the scope of work included

photointerpretation and field mapping. Other references of significance include the Ph.D. dissertation mapping of Wagner (1978), which provides a detailed analysis of bedrock units; and mapping of Crane (1988), who used oil company subsurface data to refine the interpretation of geologic structure in Contra Costa County. In the aftermath of the 3-5 January 1982 storm, the USGS issued a report which mapped the nearly 18,000 landslides that were triggered by this event within the San Francisco Bay Region, including Contra Costa County (Ellen and Wieczorek, 1988).

PUD Plan

Hillside Considerations

The Planned Unit District (PUD) Plan contains a discussion of the role of the ridges that rim the Tassajara Valley (see PUD Plan, commencing on page 39). These Hillsides are considered an important backdrop for the planned community, and the PUD Plan proposes that these hillsides be protected, while allowing "well designed development in appropriate locations."

The Contra Costa County General Plan has policies in the Safety Element that consider 26 percent slope a threshold. In areas with a slope gradient of 26 percent and greater, the hillside policies are operative. The PUD has utilized slope gradients in combination with visibility from Camino Tassajara to define "open hillsides" which are to be retained. Conversely, it considers hillsides that are not highly visible from Camino Tassajara to be developable with sensitive design. The approach to hillsides with slopes of 26 percent and greater is summarized below:

- The PUD Plan strives to avoid grading and development of all scenic ridgelines, as well as striving to retain areas of oak woodland. Approximately 50 percent of the project area is to be retained as permanent open space.

- The PUD Plan attempts to concentrate development on nearly level or mildly sloping terrain, while the intensity of development is reduced in steeper areas. The plan also concentrates hillside development in Phase 1, and systematically reduces the amount of hillside grading and hillside development in Phases 2 and 3.

- Design Guidelines for the Tassajara project include "Hillside Guidelines" and "Supplemental Hillside Guidelines." They provide suggested site planning solutions to the problems presented by hillside development. The subjects addressed in the Hillside Guidelines include heightened concern for views, architectural forms and materials, housing pad size, grading, slope stability, road and driveway cuts, fire control, maintenance roads, and recreational trails. The intent of these guidelines is to encourage design creativity and flexibility that retains a sense of hillside visual integrity.

Site Engineering, Grading, Slope Stability

The PUD Plan provides an overview of the site engineering concepts for the Tassajara development, as well as characterizing the principles that have guided the approaches to grading and slope stability (see PUD Plan, pp. 41-43). The following is intended to simplify and paraphrase, not supersede, the discussion presented in the PUD Plan.

- Grading is intended to provide stable, less steep building areas.

- Modification by grading of secondary knolls is considered allowable by the PUD Plan, with a primary emphasis on preserving the backdrop of steeper and higher ridgelines as undisturbed open space

- "Land form" grading techniques, such as rounding of tops of cuts, will be required to encourage grading to blend with natural slopes.

- Improvement along creeks and drainage ways will be made to eliminate or modify steep, unstable and/or eroding stream banks and to provide pedestrian access.

- Surface elevations of valley floors are to be raised above potential flood elevations.

- Mitigation of landslide hazards will consist of: a) stabilization using corrective grading techniques for landslide and/or colluvial deposits that present a potential hazard to improvements; and b) creation of buffer zones with flattened benches the base of hill slopes, to intercept sediment, slide debris, and/or runoff before it reaches the developed area.

- Graded slope areas will be designed to blend with surrounding slopes and will be planted with native species. A primary design goal is the integration of development into the natural setting while preserving the natural ambiance of the open hill and knoll areas.

- To reduce the amount of grading and the resultant visual impacts, the grading plan proposes the use of techniques that relate to the natural topographic contours, such as rounded slope transition.

- Certain hillsides in Tassajara are prone to landslide activity and soil creep. A general geotechnical investigation has been completed to identify and map all landslides, debris flows, and soil creep areas. This exploration has provided sufficient subsurface data to guide the preliminary land use and conceptual grading design.

- To preserve the natural terrain features, stabilization of slide masses will be limited to those that directly threaten the proposed development. Slides that do not have potential to directly impact the developed area would not be repaired. Detailed recommendations to stabilize specific landslides and unstable areas will be provided at the time of filing for Final Development Plans for each development.

- Grading will be designed so that slope stability is improved. Graded slopes will generally not be steeper than 3:1 (horizontal to vertical). This will allow graded slopes to conform more closely with natural slopes, and reduce the need for mid-slope drainage facilities.

- Where residential units back onto the toe of graded or natural slopes, buffers will be provided at the rear of the lots to facilitate removal of accumulated slope debris, if any, by the appropriate maintenance agency. The buffers may contain debris catchment areas, buttress fills, drainage structures, fire access roads and grassy swales.

Design Guidelines

The project application includes Design Guidelines. The "basic hillside guidelines" apply to areas that, after project grading, possess slopes of 26 percent or greater. Additionally, "supplemental hillside guidelines" are provided for areas that, after project grading, possess slopes of 26 percent, and are above elevation +850 feet. The location of hillside areas where the design guidelines would be operative cannot be accurately identified until more detailed grading studies are done. However, it is conceivable that under the mass grading which is proposed there will be few, if any, residences developed on slopes of 26 percent or greater. One area where this could occur is along the extreme north edge of the Tassajara development area, just south of the proposed Tassajara Creek Detention Basin. The basic hillside guides address the following site planning issues (see Design Guideline, pp. 78-82):

- site engineering
- roadway design
- architecture
- fencing and retaining walls
- landscape image
- lighting
- fire prevention and emergency vehicle access

The supplemental hillside guidelines address the following site planning issues (see Design Guidelines, pp. 83-86):

- site engineering
- building setbacks and location
- building height
- driveway design
- architectural design
- landscaping

It should be recognized that the intent of the hillside guidelines is to encourage siting that requires minimal grading and environmental disruption. Some of the areas that are currently shown for mass grading may have significant terrain features near the edges (e.g., rock outcrop, oak). During processing of

the Final Development Plans the opportunity exists to modify the grading concept, yielding a hillside lot(s) where the basic hillside guidelines or supplemental hillside guidelines would be operative.

SETTING

Regional Geology

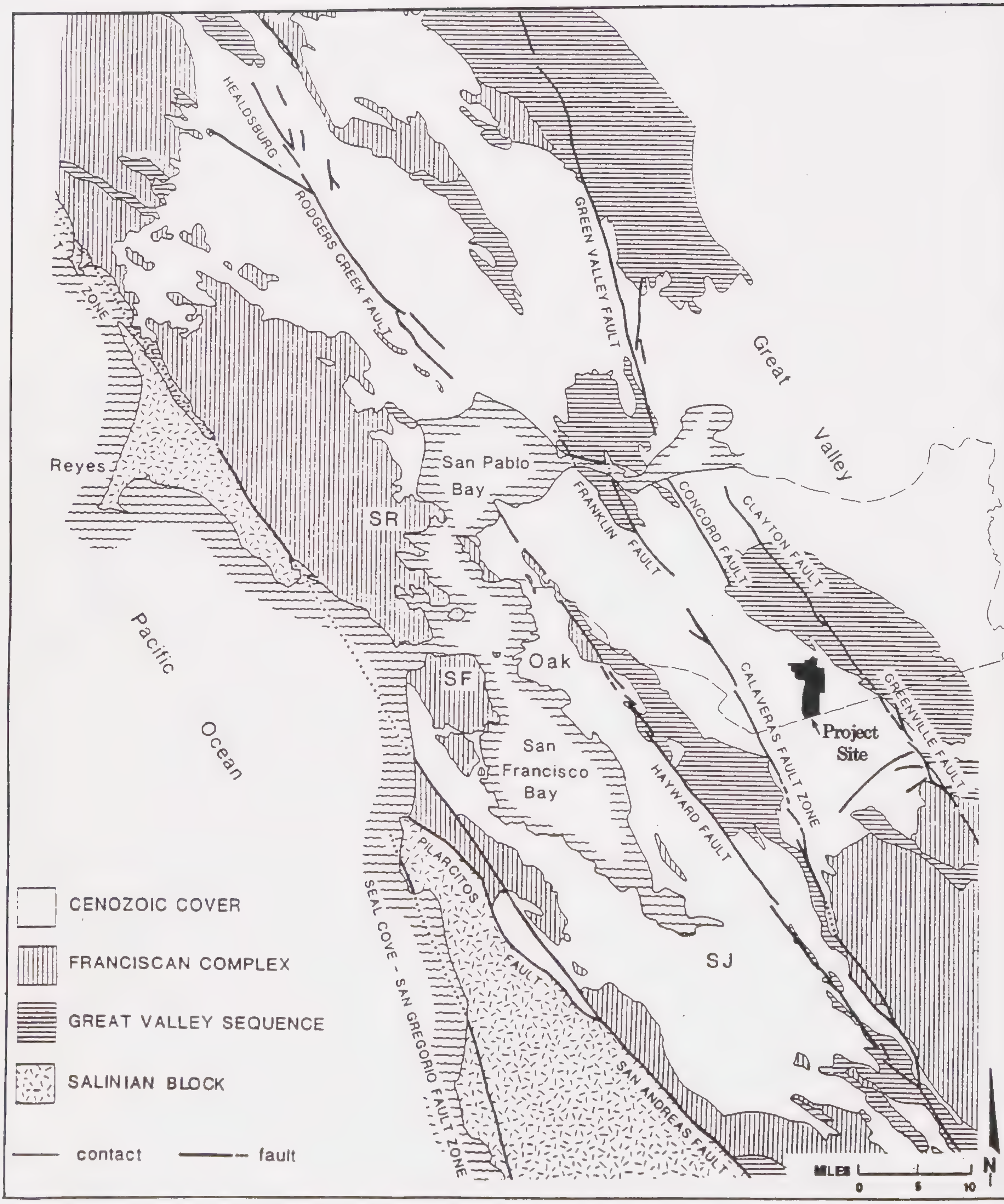
Introduction

The Tassajara project area is located along the eastern margin of the seismically active Coast Ranges geomorphic province, which stretches nearly 600 miles from the California/Oregon border to Santa Barbara County in Southern California. The complex geologic history is closely tied to the major fault system that runs parallel to the province, and are considered part of the transition zone between the North American and Pacific tectonic plates (Norris and Webb, 1990).

Mount Diablo is the major geologic and topographic feature in the Central County. Its peak, which rises 3,849 feet above sea level, is approximately six miles northwest of the project area. The core of Mount Diablo is a plug of Franciscan sedimentary rock, along with serpentinites and some volcanic rock. Rocks on the south flank of Mount Diablo are essentially vertically dipping and get successively younger going from the peak toward the project area.

The proposed development is located east of the San Ramon Valley, and north of the Livermore Valley, in a hilly upland area. The Tassajara project area is within the outcrop belt of Pliocene non-marine sedimentary rocks and volcanic tuffs that have been uplifted, tightly folded and faulted. The landslides which commonly mantle the bedrock slopes in this portion of the California Coast Ranges are a reflection of the weakly consolidated nature of the bedrock and the geologically recent (and continuing) uplift of the bedrock.

Figure 4.2-1 is a regional geologic map of the San Francisco Bay and adjoining areas. It shows major fault zones and divides bedrock units into four broad categories. No active faults are known to cross the site, but the Calaveras fault passes approximately four miles west of the site. The Greenville fault, located two miles east of the site, was the source of January 1980 earthquakes. These events were accompanied by ground failure that has been interpreted as possible fault rupture. Consequently, the Greenville fault is classified as an active fault by the CDMG. These faults, along with the Hayward-Rodgers Creek and Concord-Green Valley faults, are subsidiary branches of the San Andreas fault system, which forms the boundary between the North American and Pacific Plates and is the principal source of earthquakes in California.



Source: Darwin Myers Associates

FIGURE 4.2-1 REGIONAL GEOLOGIC MAP

Seismicity

Earthquake epicenter maps of the San Francisco Bay Region show a strong correlation with mapped active faults. High magnitude earthquakes (greater than Richter Magnitude 6) are generally associated with surface fault rupture. Smaller magnitude seismic events are indications of adjustments taking place at-depth, but they are generally not accompanied by fault offset at the earth's surface.

Notable, high magnitude earthquakes occurred on the San Andreas fault in 1838 and 1906. The Richter magnitude of these events has been estimated to be 7.0 and 8.3, respectively. The 1989 Loma Prieta earthquake on the San Andreas fault, which had a magnitude of 7.0, produced co-seismic[1] deformation near the crest of the Santa Cruz Mountains, but was not accompanied by surface fault rupture.

The Hayward fault was the source of earthquakes estimated to have Richter magnitudes of 7.0 (M7) in 1836 and 1868. The closest large magnitude historic earthquake to the project area was the 4 July 1981 earthquake on the Calaveras fault. This event, which is believed to have caused surface fault rupture in the hills just west of the San Ramon Valley, produced ground shaking of Modified Mercalli Intensity VII[2] in the Central Contra Costa County area. The 1968 earthquake on the Hayward fault yielded Modified Mercalli intensities of VIII in the Central Contra Costa County area (Toppozada et al, 1981).

More recently, the Danville earthquake swarm of 1970 yielded hundreds of earthquakes in the Sycamore Valley area. The epicenters associated with this swarm are plotted with small, dark symbols in Figure 4.2-2. These epicenters are concentrated along Camino Tassajara Road, west of Dougherty Road. Another swarm occurred in the spring of 1990. The epicenter of these seismic events defined a pattern which generally coincide with the alignment of Livorna Road in Alamo. Figure 4.2-2 shows the location of these swarms with respect to the Tassajara project area. (These earthquakes were plotted using a heavy, dark symbol.) The April 1990 swarm possessed a northeast trend and occurred in the "gap" between the Concord and Calaveras faults. Most geologists now believe the Concord fault to be the northern extension of the Calaveras fault, and the swarms are a manifestation of the transfer of stress from one fault to the other.

Note that no earthquake epicenters are plotted in the project area. Nevertheless, because of the location of the site within an area of active faults, there is potential for strong earthquake shaking to trigger damage to man-made structures, or for ground shaking to trigger landslides, liquefaction or other forms of ground failure. The probability of a large earthquake (Magnitude 7 or greater) along the San Francisco Peninsula segment of the San Andreas fault zone is about 23 percent over a 30-year period (USGS Working Group, 1990). The probability of a large earthquake on the northern East Bay segment of the Hayward fault zone is about 28 percent for the same period, and 22 percent for the Rodgers Creek fault (USGS Working Group, 1990; Lindh and Oppenheimer, 1992). The probability of an magnitude 6 earthquake along the northern Calaveras is estimated to be approximately 50 percent in

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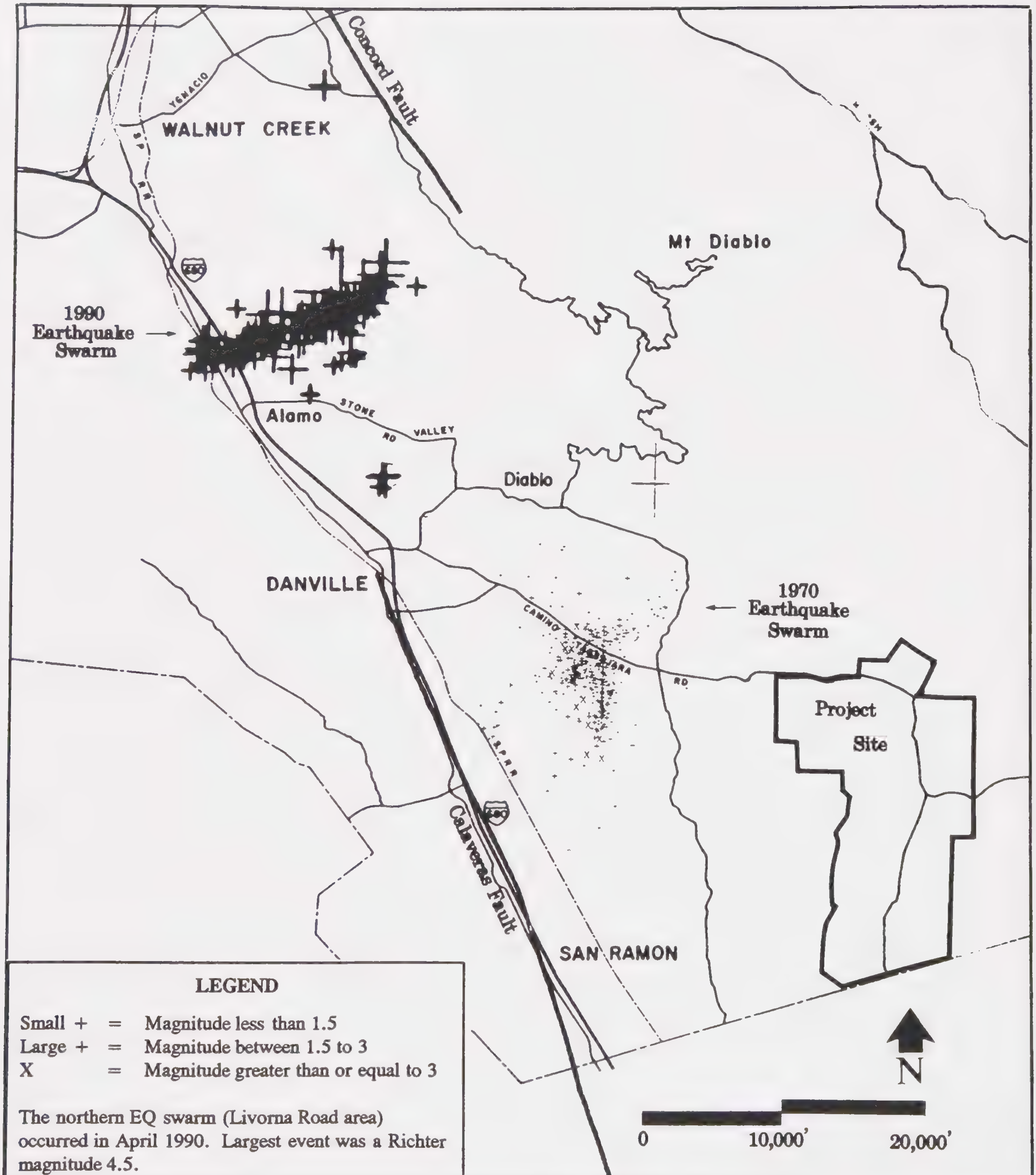
1 Contemporaneous with the seismic event, but not directly associated with the fault plane.

2 VI = Felt by everyone indoors.
VII = Frightens everyone; general alarm and everyone runs outdoors.
VIII = General fright, and alarm approaches panic.



Source: Darwin Myers Associates

FIGURE 4.2-2 EARTHQUAKE SWARMS

the next 30 years, and 10 percent for a magnitude 7 event (Lindh and Oppenheimer, 1992). The total probability that one or more large earthquakes will occur in the 30-year period in the San Francisco Bay region is estimated to be 90 percent (USGS Working Group, 1990).

In the 9 June 1994 edition of the *Contra Costa Times*, David Schwartz, a seismologist with the USGS, is quoted as indicating that the probability of a major earthquake in the Bay Area by the Year 2020 has been underestimated previously and it is probably at 90 percent (or greater). The reevaluation of earthquake risk was brought about by the discovery of new faults and by significant new information on the behavior of faults. (Some faults have been found to be slipping faster than originally suspected.) The *Contra Costa County General Plan,* Table 10-5, pp. 10-21, provides estimates of the maximum parameters for faults in Contra Costa County, as well as the San Andreas fault. Data relevant to the site is presented in Table 4.2-1.

TABLE 4.2-1
ESTIMATED MAXIMUM PARAMETERS
FOR FAULTS AFFECTING THE PROJECT SITE

Fault	Richter Magnitude[1]	Distance (miles)[2]	Peak Bedrock Acceleration[3]
San Andreas	8.25-8.5	30.0	.20-.25 g[4]
Hayward	6.5-8.5	12.0	.13-.35 g
Calaveras	6.5-7.25	4.5	.25-.50 g
Concord	5.75-6.5	8.5	.17-.35 g
Greenville	5.75-6.5	3.5	.20-.45 g
Antioch	5.75-6.5	10.0	.15-.30 g

1 The first listed magnitude is maximum probable earthquake; the second is the maximum credible earthquake.
2 Distance of project site from fault in miles.
3 Interpolated from Table 10-5, *Contra Costa County General Plan.*
4 g = acceleration due to gravity, about 32 feet per second per second.

Source: *Contra Costa County General Plan*, 1996.

In summary, the Calaveras fault is the controlling fault with respect to ground shaking in the Tassajara project area. The maximum credible earthquake on the San Ramon segment of this fault would have a Richter magnitude of approximately 7.25, and could result in peak horizontal ground accelerations of 0.5g in the project area, with a duration of strong shaking on the order of 30 seconds. The ground motion characteristics at specific building sites in the project area will be dependent on the characteristics of the seismic source, its magnitude, distance from the site, as well as local geologic and topographic conditions in the project area and other parameters.

Topography and Landforms

Topography in the project area is dominated by resistant northwest-trending ridgelines with rounded northeast-trending secondary ridges. Elevations vary from a high of 900 to 1,000 feet along ridgelines to a low of 450 feet on the valley floor. The slopes are typically steepest just below the ridgecrest (about 2:1, horizontal to vertical) and tend to flatten gradually toward the base of the hillside.

The northwest portion of the project is in the Alamo Creek watershed, with the remainder in the Tassajara Creek watershed. Both creeks drain south toward Dublin. Ultimately runoff is conveyed through Niles Canyon and outfalls into San Francisco Bay. The creeks are actively eroding and in some locations have cut nearly vertical creek banks. Near the Alameda/Contra Costa County line, Tassajara Creek banks are incised up to 40 feet. Localized sloughing and bank failures commonly occur along the channels. (Section 4.3 provides a discussion of drainage features in the project vicinity.)

Twenty Six Percent Slopes

A large percentage of the Tassajara project area has slopes in excess of 26 percent. According to the applicant's engineer, 1,810 acres of the 4,533-acre site[3] consist of slopes greater than or equal to 26 percent (Palffy, 1994). The slope map was generated manually by the applicant using the applicant's topographic map. The information was then digitized to allow comparison of slope information with other digitized data. Figure 4.2-3 shows the location and distribution of slopes equal to or in excess of 26 percent.

The County *General Plan* contains a number of policies that restrict development and extensive grading on slopes steeper than 26 percent (Policies 10-24 and 10-29). County *General Plan* policies relating to slope stability are presented below (County, 1996):

10-22 Slope stability shall be a primary consideration in the ability of land to be developed or designated for urban use.

10-23 Slope stability shall be given careful scrutiny in the design of developments and structures, and in the adoption of conditions of approval and required mitigation measures.

10-24 Proposed extensions of urban or suburban land uses into areas characterized by slopes over 15 percent and/or generally unstable land shall be evaluated with regard to the safety hazard prior to the issuance of any discretionary approvals. Development on open hillsides and significant ridgelines throughout the county shall be restricted, and hillsides with a grade of 26 percent or greater shall be protected through implementing zoning measures and other appropriate actions.

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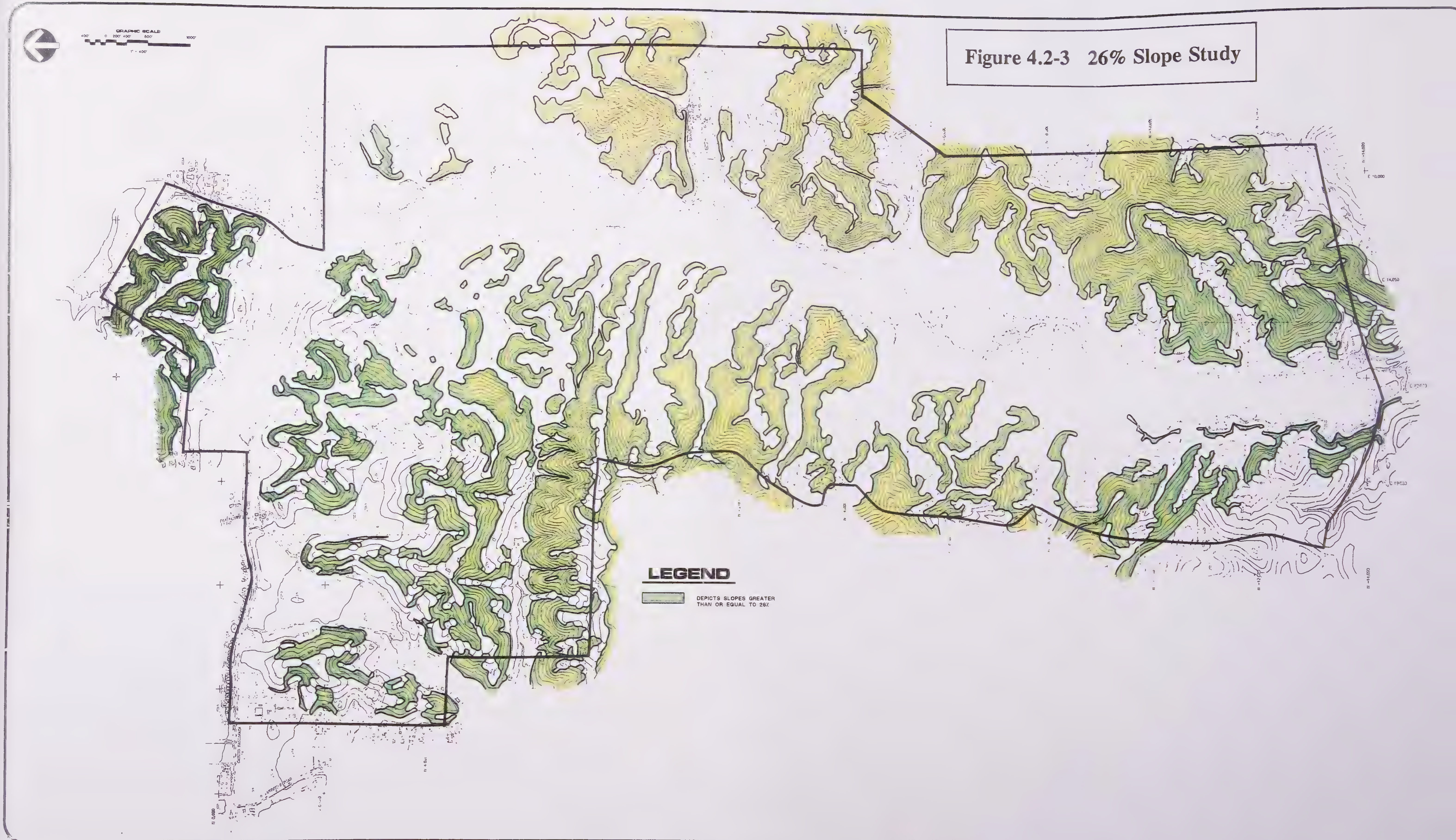
3 The area surveyed includes 42 non-TVPOA acres. The estimate disregards over-steepened creekbanks, except where banks are over 25 feet high. There may be small areas with slopes of 26% or greater which cannot be identified using base maps with a contour interval of 25 feet. Similarly, these may be localized areas with slopes of less than 26% within the shaded areas in Figure 4.2-3.

Figure 4.2-3 26% Slope Study



10-25 Subdivision of rural lands outside planned urban areas down to the allowed minimum parcel size shall be discouraged, if the parcels are within, or only accessible through geologically unstable areas.

10-26 Approvals of public and private development projects in areas subject to slope failures shall be contingent on geologic and engineering studies which define and delineate potentially hazardous conditions and recommend adequate mitigation.

10-27 Soil and geological reports shall be subject to the review and approval of the County Planning Geologist.

10-29 Significant hillsides with slopes over 26 percent or more shall be considered unsuitable for types of development which require extensive grading or other land disturbance.

10-30 Development shall be precluded in areas when landslides cannot be adequately repaired.

10-31 Subdivisions approved on hillsides which include individual lots to be re-sold at a later time shall be large enough to provide flexibility in finding a stable buildable site and driveway location.

10-32 The County shall not accept dedication of public roads in unstable hillside areas, or allow construction of private roads there which would require an excessive degree of maintenance and repair costs.

Geologic Units

The project site is in the outcrop belt of Pliocene non-marine claystone, siltstone and fine-grained sandstone, with interbedded pebble conglomerate and volcanic tuff beds. Based on absolute age dating of volcanic tuff beds, the age range of these sediments is 8.5 to 2.5 million years.

The deposition environment is considered to have been a gently sloping alluvial plain with a sediment source located to the west. Geologists have interpreted the conglomerates as stream channel deposits and some fine-grained sediments are thought to be lake deposits. This sequence is referred to as the Orinda Formation (Brabb, 1971); Sycamore Formation, Wagner, 1978); Pliocene non-sedimentary Rocks, Dibblee, 1980; Crane, 1988); Contra Costa Group, (Creely, et al, 1982); "Undivided Continental Rocks, Davenport, 1986); and Green Valley/Tassajara Group (Graymer, et al., 1995). Characteristically, the sandstone strata are more resistant to erosion and form ridges. Claystone and clayey siltstone tend to be soft and more erodible, forming swales and valleys.

Figure 4.2-4 is a detailed geologic map of the project vicinity prepared by Engeo, Inc. The sedimentary rocks described above are labeled Tps. However, near the southern boundary of the study area the rocks are younger and are even finer grained. They are named the Tassajara Formation (QTt) and are

considered to be as young as early Quaternary. Also note that the floor of the Tassajara Valley and its major tributaries, along with the floor of the San Ramon and Livermore valleys, are underlain by alluvial deposits (Qa) of late Quaternary age. With regard to Tassajara Creek, the valley was cut by stream erosion, followed by a period of sedimentation which created a nearly level valley floor that averaged approximately 1,500 feet in width. During historic time, active erosion has occurred on the valley floor, carving a steep-sided creek channel that is now 40 feet deep at the Alameda/Contra Costa County line.

Figure 4.2-4 divides landslide deposits into four categories, as well as mapping the distribution of colluvium, alluvial fan and terrace deposits. This figure also presents Engeo's interpretation of bedrock geology and geologic structure.

Geologic Structure

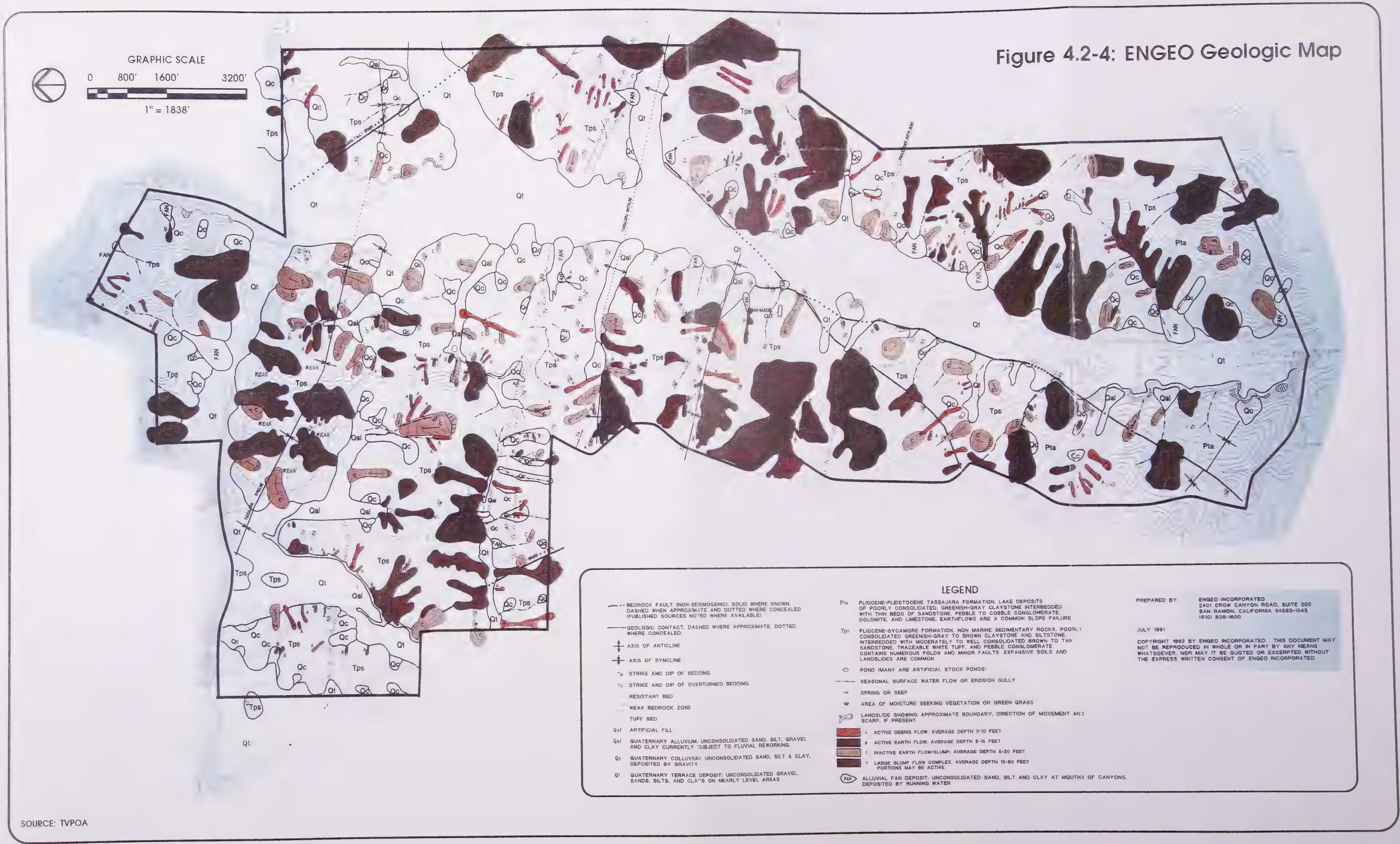
As Figure 4.2-5 indicates, rocks in the vicinity of the site are tightly folded and cut by faults. The fold axes are colored red (anticlines) and blue (synclines). Faults are colored green. Most faults in the project area trend nearly east-west. Figure 4.2-6 is a geologic cross-section which trends northeast-southwest, crossing Camino Tassajara at the Finley Road intersection. (See Figure 4.2-5 for line of section, AA'.) This cross-section is based on interpretation of outcrop data, the logs of oil company exploration wells and geophysical data. The section indicates a complex of thrust faults with several thousand feet of displacement, which appear to be radiating away from the Calaveras fault (to the west) and the Greenville-Clayton fault (to the east). The tight folds are interpreted as a by-product of the faulting. Because geologic units of Pliocene and Pliocene-Quaternary age are offset by these faults, displacement has occurred during the Quaternary Period (age 1.6 million years to present). The tectonic forces within the earth's crust and upper mantle that are responsible for the folds and faults shown in Figure 4.2-6 may be related to the convergence of the North American Pacific Plates. The deformation is on-going, and the thrust fault may be a seismic source. However, the faults which occur in the project area are not known to offset Holocene alluvium (age 11,000 years to present). Hence, they are not classified as active faults by either the USGS or CDMG. It is also clear that the faults in the planning area would have recurrence intervals that are substantially longer than the known active faults.

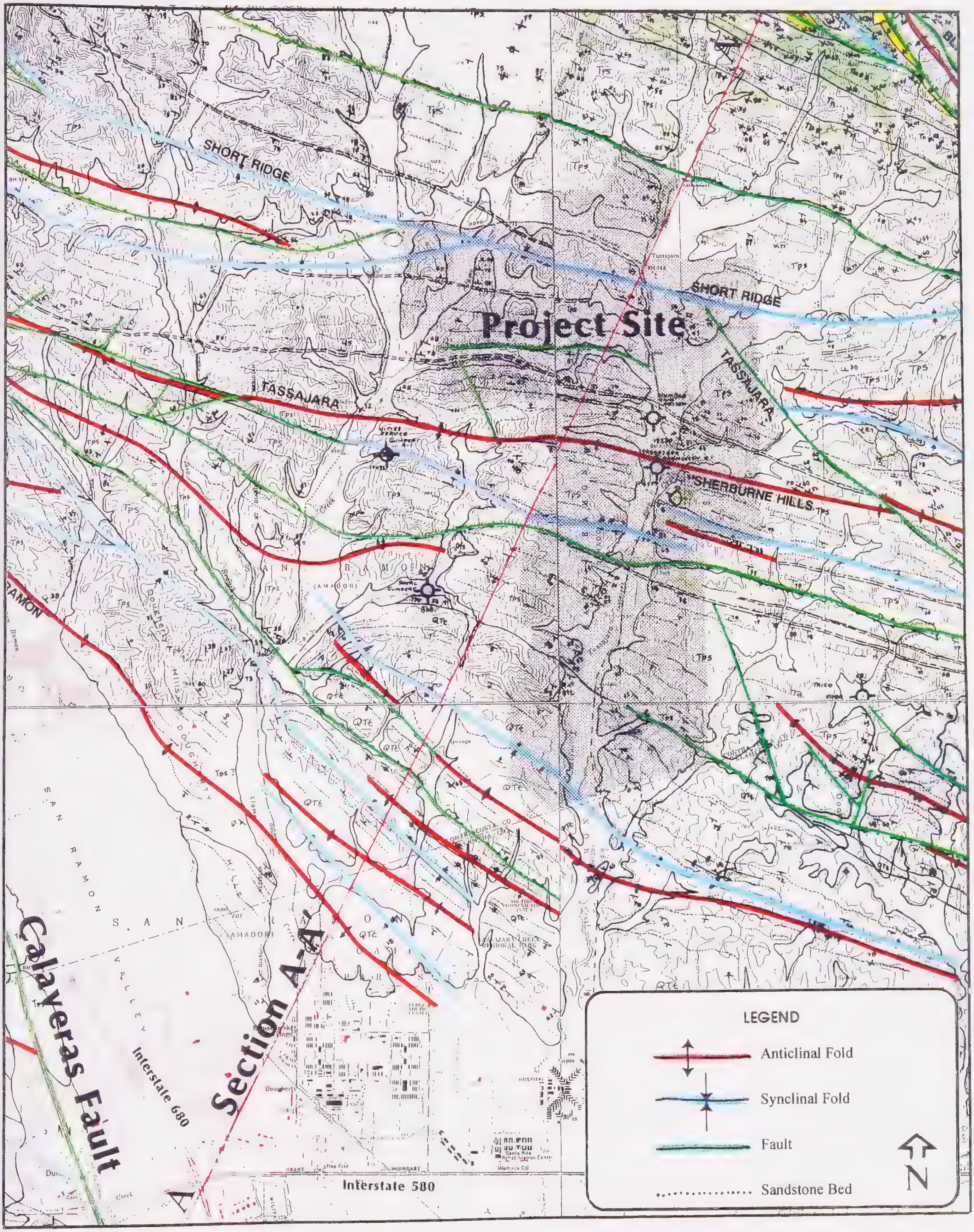
Landslides

The USGS has prepared photointerpretative landslide maps of the entire San Francisco Bay Region, including the project area (Nilsen, 1975). The USGS maps are based on interpretation of 1960s and early 1970s photographs, and landslides are not classified by activity status or type of landslide deposit. The photointerpretative maps were not field checked for accuracy, and they do not show slides that have occurred during the past 20 plus years. Nevertheless, the map fulfills its intended function which is to identify areas that require site-specific geologic studies.

Contra Costa County has included a reduced-scale version of the USGS landslide map in the County *General Plan* (Figure 10-6, pp 10-41), and adopted policies directed to the hazard posed by landslides.

Figure 4.2-4: ENGEO Geologic Map

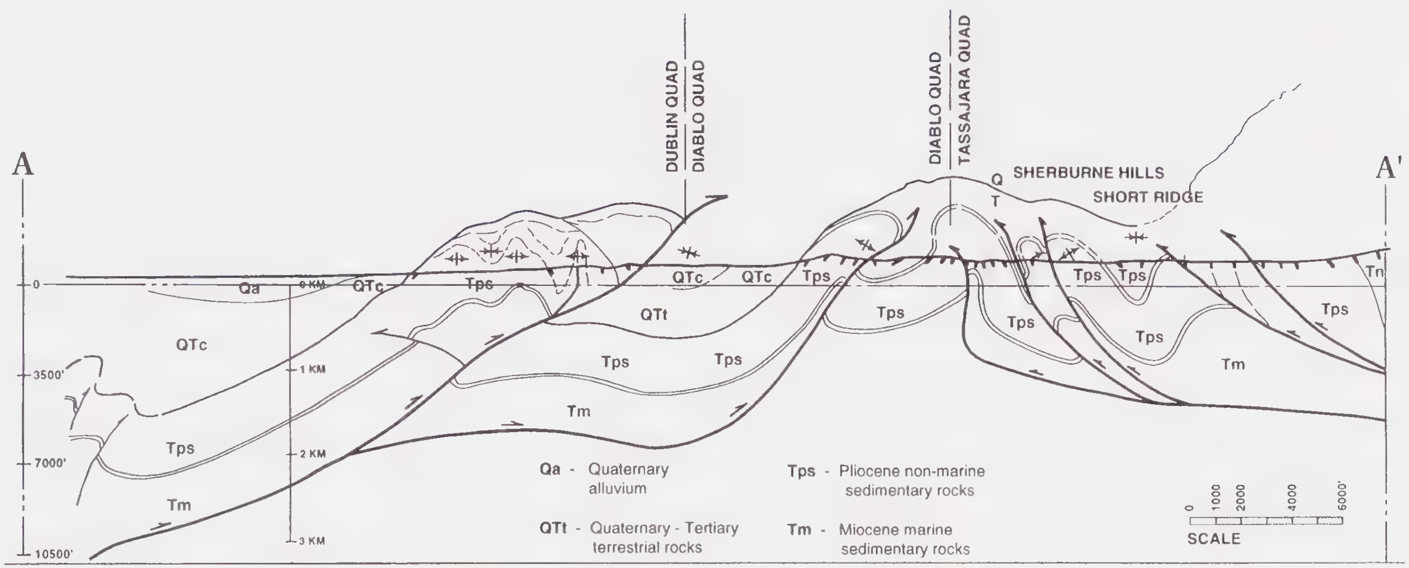




ource: Darwin Myers Associates

Scale: 1" = 5,000'

IGURE 4.2-5 CRANE GEOLOGIC MAP



Source: Crane and Bartow (1988)

See Figure 4.2-5 for line of section

FIGURE 4.2-6 GEOLOGIC CROSS-SECTION AA'

During routine review of development applications, the planning staff of the County reviews full-scale copies of the USGS landslide maps (scale: 1"=2000') as one factor in determining if potential landslide hazards exist on a site. The USGS map shows over 150 photointerpretative landslides on the Tassajara project site. The largest of these has a mapped extent of more than 60 acres. (*General Plan* landslide hazard policies are presented above in the "26 Percent Slope" subheading.)

In summary, *General Plan* policies toward landslide hazards deal with development on a project-by-project basis. It has been determined that information on this hazard from published mapping is not sufficiently accurate to serve as a basis for land use decisions. Instead, the USGS landslide map is used as a "red flag" to identify sites which may be susceptible to sliding. Geologic and geotechnical studies are required to evaluate the hazard, based on site specific surface and subsurface data. If slope stability problems exist, geotechnical reports must identify means to mitigate this hazard. The scope of the required reports must correspond to the nature of the underlying project approval that is being requested. For the proposed project there are five stages where increasingly detailed geologic and geotechnical analysis will be required. These stages are as follows:

- GPA/*Preliminary Development Plan* Application
- Final Development Plan/Tentative Map Submittal
- Condition(s) of Approval of Tentative Map
- Grading Permit Application
- Progress Reports During Grading/Grading Completion Report

The County planning staff has determined that the Engeo report (dated 22 March 1993) is adequate for processing of GPA/*Preliminary Development Plan* application.

Relative Slope Stability

In 1979 the USGS published a relative slope stability map of the San Francisco Bay Region (Nilsen et al, 1979). The map was based on the following parameters: a) slope, b) landslides, and c) bedrock geology. For Contra Costa County, the information on slope was provided by a digitized slope map generated by the USGS; information on the distribution of landslides was provided by the USGS landslide mapping (Nilsen, 1975), and information on bedrock geology was provided by USGS geologic mapping (Brabb, 1971). The relative slope stability map divided the San Francisco Bay Region into five categories, ranging from stable (Category 1: slopes less than 5 percent) to unstable (Category 5: areas underlain by or immediately adjacent to landslides).

According to the USGS map, valley bottom land in the Tassajara project area (e.g., floor of the Tassajara Valley) was placed in Category 1. Hillside areas underlain by landslide deposits, or areas where there is a concentration of landslides were placed in Category 5. The remainder of the hillside area was placed in Category 4 (moderately unstable). This category is defined as sloping lands (greater than 15 percent slopes) underlain by bedrock units susceptible to landsliding. When compared with nearby areas, the stability ratings of the Tassajara project site are generally similar to Dougherty Valley, Blackhawk and Sycamore Valley.

Soils

Mapped soils consist of clays and are developed on colluvium and weak, easily weathered bedrock. The upland areas of the project are mainly mantled by the Diablo clay (DdD, DdE, DdF), although local, especially steep areas, are covered by the Alo clay (AaG). Valley floor areas of the project are characterized by the Conejo clay loam (CeA, CeB) and Cropley clay (CkB) (see Figure 4.2-7).

Liquefaction

Liquefaction is a specialized form of ground failure caused by earthquake ground motion. It is a condition occurring in water saturated, unconsolidated, relatively clay-free sands and silts triggered by hydraulic pressure. Soil particles are forced apart and into quicksand-like liquid suspension. In the process, normally firm but wet ground materials are transformed into semi-liquid mixtures.

The loss of strength by a liquefied soil can trigger foundation failure of man-made structures, instability of slopes and lateral spreading of level ground. The increase in pore water pressure within the soil results in the upward flow of water. Evidence of liquefaction observed during past earthquakes include the floating of embedded structures, such as tanks; as well as the tilting and settlement of buildings. As the pore water pressures dissipate, the sand densifies, causing ground surface and structural settlements. If the soil deposit is dry, and cannot liquefy, vibratory shaking from earthquakes may still produce compaction and accompanying structure settlement.

Historically, ground failure, in its various forms, including liquefaction, has been a problem in areas of continually wet, unconsolidated geologic units. In Contra Costa County, the areas which are most susceptible to seismically triggered ground failure include the geologically young sediments of the San Francisco Bay estuary, including the Delta lowlands, as well as recent stream channel and sand dune deposits. Liquefaction cannot occur in deposits of dense sand or clays. Soils prone to liquefaction include loose to medium dense sands and silts occurring below the water table. Liquefaction of coarse gravels is rare because they are highly permeable and dissipate excess pore water pressures rapidly.

Contra Costa County retained Woodward-Clyde Consultants (WCC), a geotechnical firm, to analyze available borehole and published data, and develop a liquefaction potential map of the entire County. A reduced-scale version of the WCC map is presented in the County General Plan This map indicates that the floor of Tassajara Creek Valley, along with Alamo Creek Valley, are within an area rated as having a "generally high" liquefaction potential; the sloping hillside areas are rated "generally low." The *General Plan* includes policies directed to the hazard posed by liquefaction, which are presented below (County, 1996):

Goals

10-A To protect human life, reduce the potential for serious injuries from earthquakes; and to reduce the risks of property losses from seismic disturbances which could have severe economic and social consequences for the county as a whole.

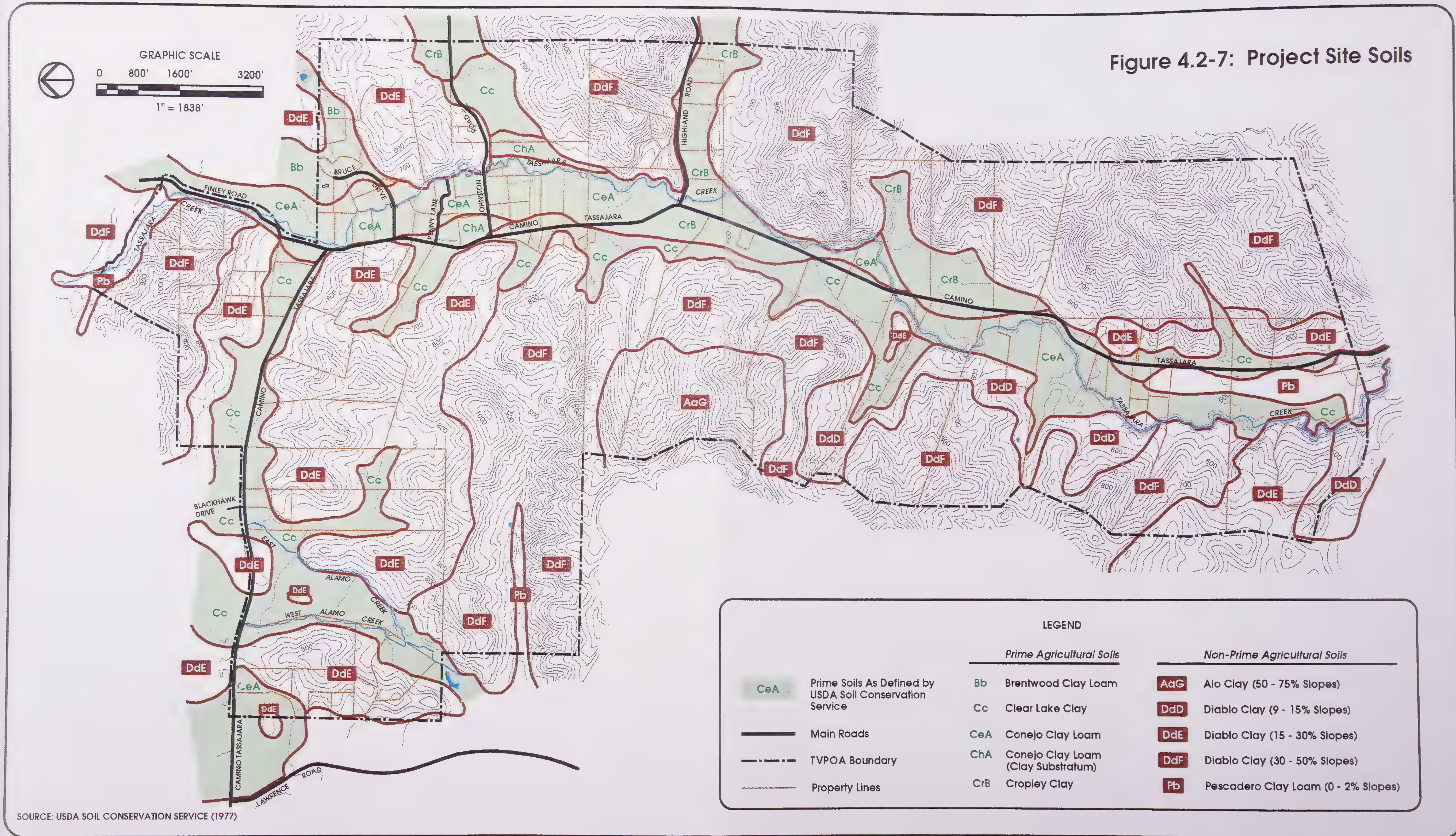


Figure 4.2-7: Project Site Soils

SOURCE: USDA SOIL CONSERVATION SERVICE (1977)

10-B To reduce to a practical minimum injuries and health risks resulting from the effects of earthquake ground shaking on structures, facilities and utilities.

10-D To reduce to a practical minimum the potential for life loss, injury, and economic loss due to liquefaction-induced ground failure, levee failure, large lateral land movements toward bodies of water, and consequent flooding; and to mitigate the lesser consequences of liquefaction.

Liquefaction Policies

10-18 This *General Plan* shall discourage urban or suburban development in areas susceptible to high liquefaction dangers and where appropriate subject to the policies in 10-20 below, unless satisfactory mitigation measures can be provided, while recognizing that there are low intensity uses such as water-related recreation and agricultural uses that are appropriate in such areas.

10-20 Any structures permitted in areas of high liquefaction danger shall be sited, designed and constructed to minimize the dangers from damage due to earthquake-induced liquefaction.

10-21 Approvals to allow the construction of public and private development projects in areas of high liquefaction potential shall be contingent on geologic and engineering studies which define and delineate potentially hazardous geologic and/or soils conditions, recommend means of mitigating these adverse conditions; and on proper implementation of the mitigation measures.

In summary, the County recognizes the problem posed by liquefaction, and *General Plan* policies toward liquefaction deal with development on a project-by-project basis. It has been determined that information on liquefaction potential is not sufficient to designate areas of "generally high" liquefaction potential for open space land uses. The reason is that information on the occurrence of liquefiable soils varies in quality from place to place. Many lands classified as "generally high" potential lack silty sands, or the sands are too well consolidated or too clayey to liquefy, or they are above the water table. Instead, the liquefaction potential map is used as a "red flag" to identify sites which may be susceptible to liquefaction. Geotechnical studies are required to evaluate the hazard, based on site-specific borehole and laboratory data. If liquefiable sands are present, the geotechnical report must identify means to mitigate this hazard.

During the review of land development applications, the planning staff examines full-scale copies of the liquefaction potential maps (scale 1"=2000'). For properties in the area rated "generally high," detailed studies are required to make a site-specific evaluation of the hazard; for properties rated "moderate to low," soil reports submitted with subdivision applications are routinely required to make a preliminary assessment of the hazard. Commonly, the scope of liquefaction studies are more rigorous in areas of "generally high" potential.

Grading Plan

The project application provides a plan that concentrates the proposed development on approximately 41.6 percent of the General Plan Amendment area, with approximately 58.4 percent (2,646 acres) retained as "open space" and "parks and recreation." Within the lands designated for development, mass grading is proposed. Additionally, open space lands adjacent to developed areas and some parks will be graded. Where they are to be graded, open space lands are proposed to have slope gradients of 3:1 (horizontal to vertical), and a dressing of topsoil will be placed on the surface of such slopes to facilitate revegetation. Additionally, the project application concept is for contour rounding of such lands that mimic natural terrain features.

The preliminary grading plan for the entire project area has been designed to accomplish an earthwork balance. The current earthwork analysis based on plans with a scale of 1"=400' and a 25-foot contour interval. It is reasonable to anticipate that as the project evolves and more detailed engineering studies are performed, more precise information will be available on grading volumes, and adjustments will be made to achieve a balance within the proposed development. It is obvious that individual neighborhoods will not necessarily balance, although a phase may balance. The project application indicates that Camino Tassajara will not be utilized as a haul road for moving earth from one portion of the project area to another. To the extent possible, lands on opposite sides of Camino Tassajara will be designed to balance independent of one another. It is not possible to guarantee that opposite sides of the road will balance. For that reason, the project application anticipates that crossing Camino Tassajara at right angles, with proper traffic controls would be feasible. However, right angle crossing would not be proposed after the ultimate roadway sections were constructed.

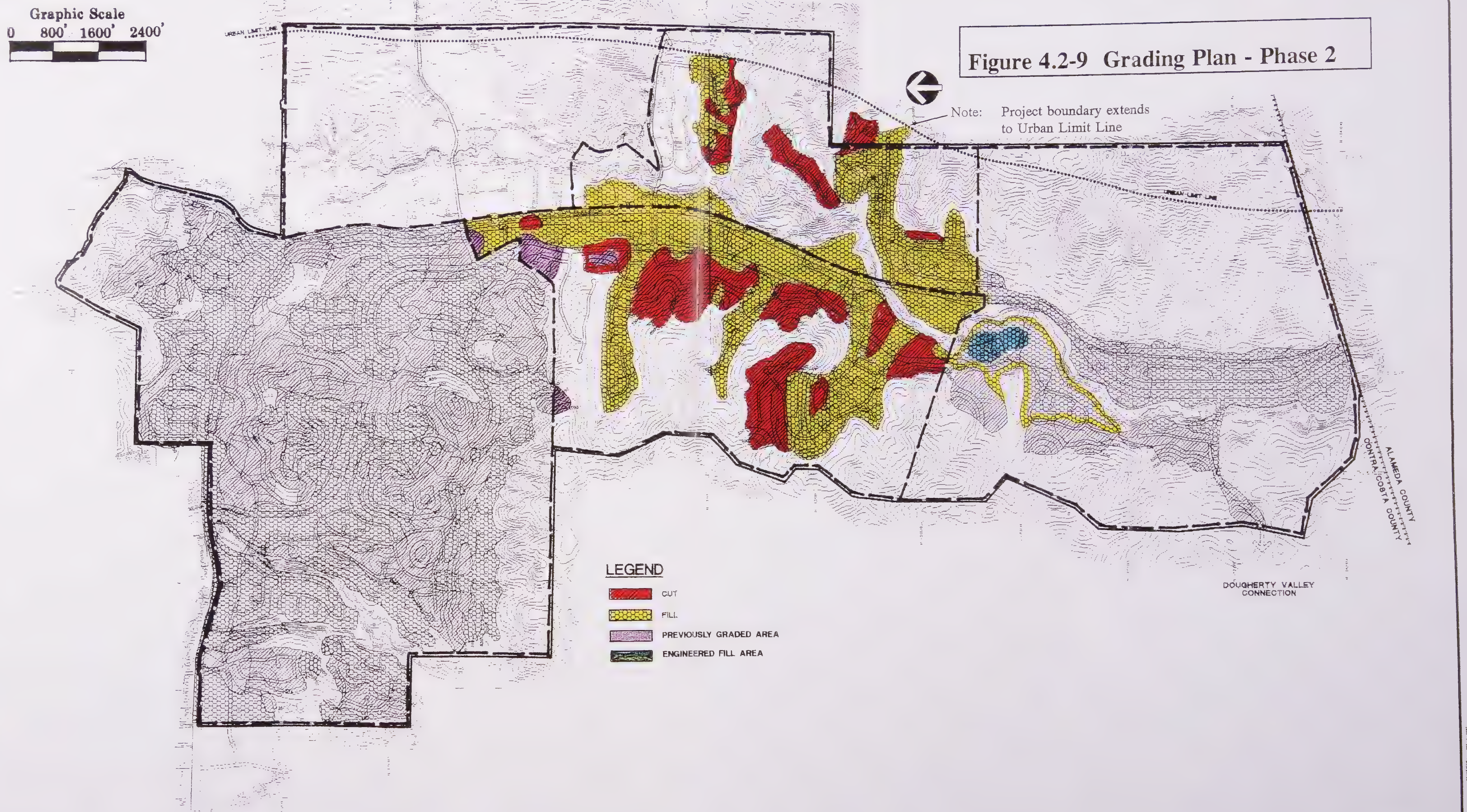
To illustrate the grading concept, the project application includes grading plans by phase as well as a grading plan for buildout of the project. These plans, which are presented in Figures 4.2-8 through 4.2-10, are described below. These grading plans represent snapshots of grading at the end of Phase 1, end of Phase 2 and end of Phase 3. The plans do not imply that all of Phase 1 will be graded at one time, under a single grading permit. The same thing can be said of Phases 2 and 3. Individual phases require balance areas, as Figures 4.2-8 and 4.2-9 indicate. Grading for a portio of a phase may also require import or export of earth materials from or to other development areas within the same phase. Balancing earthwork between different projects within a phase poses difficulties. In such instances, the applicant for a grading permit must provide information on the haul route, traffic safety precautions, information on how the balance area would be graded, and evidence that the owner of the balance area had granted a grading easement. The grading permit application would also be subject to review by the Community Development Department, and conceivably could require approval of a land use permit for a quarry and/or approval of a Reclamation Plan.

It should also be recognized that the grading plans submitted by the project proponent do not reflect the development concepts and approach to grading of Shapell Industries on the Wendt Ranch project. The following discussion presents a description of grading plans submitted with the application for the Tassajara project (GPA 930008; RZ 943022). For an analysis of the Wendt Ranch grading, see the environmental impact report prepared for that project (GP-95-0012 and RZ 963037).

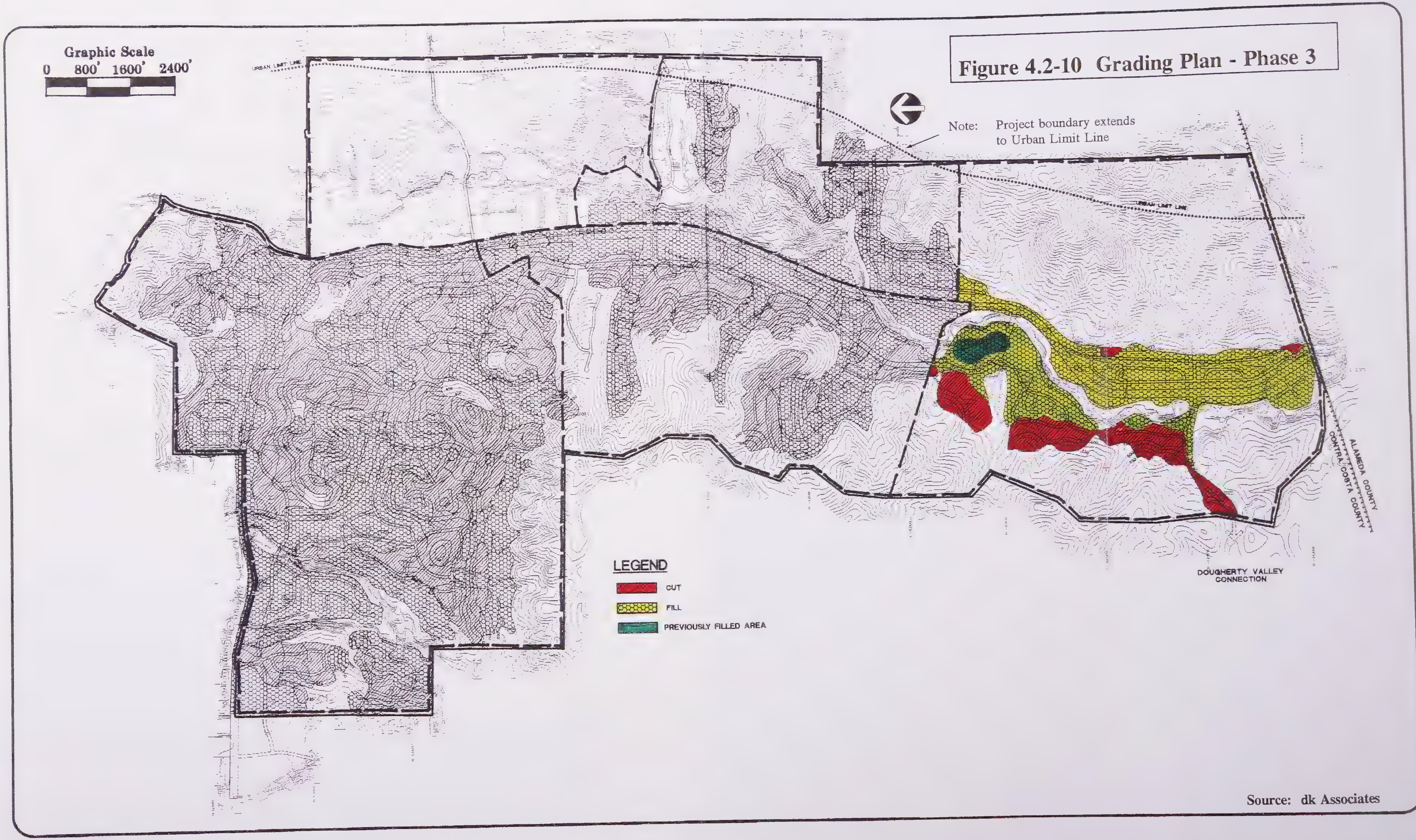
Figure 4.2-8 Grading Plan - Phase 1

Source: dk Associates

Figure 4.2-9 Grading Plan - Phase 2



Source: dk Associates


Graphic Scale
0 800' 1600' 2400'
Figure 4.2-10 Grading Plan - Phase 3
Note: Project boundary extends to Urban Limit Line
URBAN LIMIT LINE
LEGEND
CUT
FILL
PREVIOUSLY FILLED AREA
DOUGHERTY VALLEY CONNECTION
ALAMEDA COUNTY
CONTRA COSTA COUNTY
Source: dk Associates

Phase 1 Grading Plan (Figure 4.2-8)

This plan illustrates Phase 1 grading in green (fill) and red (cut). It also identifies potential balance areas[4] in Phase 2 (violet). The unshaded lands in Phase 1 are not proposed for grading. They include the channel of the East Branch of Alamo Creek, a steep, wooded slope in the southwest corner of Phase 1, a major open ridge in the northeast corner of Phase 1, and the flanks of certain knolls that are within the developed area. The deepest cuts in this phase are 110 feet and the thickest fills are 60 feet. The proposed graded slopes are all 3:1 (horizontal to vertical), with the possible exception of the segment of Camino Diablo just southeast of its intersection with Finley Road. In this area, the road is bounded by a wooded reach of Tassajara Creek on the northeast and a steep-sided knoll on the southwest. During 1995, the Public Works Department made safety-related improvements to this segment of the existing two lane rural road. The grading required for widening to four lanes cannot be resolved until more detailed design studies are performed. It appears unlikely that the widening could be accomplished using the 3:1 slope gradient that is the general standard of the project. It appears more likely that a steeper slope gradient, possibly in combination with a retaining wall or keystone wall would be needed if the existing residence at the crest of the knoll is to be preserved. A soil report prepared for the Public Works project on Camino Tassajara indicated that slopes less than 3:1 at this location would have the potential for instability. Elsewhere in Phase 1 and throughout the project, 3:1 gradients were used as planning-level criteria for the slopes shown in Figures 4.2-8 through 4.2-10.

Three grading sections have been prepared that provide insight into the approach to Phase 1 grading. They are annotated to show proposed roads, dwelling units and landscaping, as well as proposed general land use designation, and other information. Full scale (1" = 100') copies of these sections are available for review in the Community Development Department. Reduced scale copies of the sections (1"=300') are presented in Appendix B of the DEIR.

Phase 2 Grading Plan (Figure 4.2-9)

This plan illustrates Phase 2 grading. The explanation for this figure has four colors: red (cut), green (fill), violet (areas of proposed cut that were taken to final grade during Phase 1 grading), teal (engineered fill area). The Phase 2 grading is expected to generate a surplus of fill. The teal colored area is the balance area in Phase 3 where surplus fill would be placed as engineered fill. It is within a much larger, irregularly shaped region outlined in yellow. This is an area that is proposed to receive fill during Phase 3. Thus, any earthwork performed in the Phase 3 area during Phase 2 grading would

[4] A balance area is the location where any surplus fill would be placed or where earth materials could be borrowed for use in a fill. The three violet areas in Figure 4.2-8 are areas of planned cuts during Phase 2 grading. Based on available data, completing Phase 1 grading will require borrowing earth from Phase 2. Figure 4.2-8 suggests bringing these three contiguous borrow areas to their final grade near the end of Phase 1 grading. If any additional fill material is needed in Phase 1, it could be taken from the "bulls eye" area in Phase 2. The red line outlines the limit of an area proposed for cut during Phase 2 grading. The violet area within the red line indicates the approximate area that borrowing of fill could be required to complete Phase 1 grading.

be the placement of fill. The application indicates fill would be placed in accordance with the recommendations and under the field observation of a geotechnical engineer. The compaction and subdrainage of the fill would be consistent with the ultimate land use of the balance area. This would avoid the need to rework the fill during Phase 3 grading. The maximum depth of cut in Phase 2 is 110 feet and all fills are less than 50 feet thick. The highest man-made slope is a 265-foot-high cut and fill slope, located due west of the proposed Highland Road/Country Loop Road intersection. The proposed gradient of this slope is 3.25:1.

Figure 4.2-9 indicates that the channel of Tassajara Creek will be left natural. The only exception to this general statement is for planned road crossings of the creek. The existing creek crossings at Johnston Road and Highland Road are bridges. The County is planning to replace these two bridges in the summer of 1996. Both bridges will be built to current standards for two-lane bridges. The Highland Road bridge will be located a little further to the south to better facilitate construction of the bridge. The bridge replacement at Camino Tassajara south of Highland Road was started during the summer of 1995. All remaining work includes some hillside development areas that will generate a surplus of cut. For these projects, balance areas on the valley floor are essential. Camino Tassajara is to be relocated and widened to six lanes and median; and Johnston Road and Highland Road crossings of Tassajara Creek may need to be widened. Assuming that the crossings will not need to be relocated by the Tassajara project, the drainage improvements may be limited to expanding road width at the Camino Tassajara, Johnston and Highland Roads at these crossings.

According to the grading concept, fill will be placed on the floor of Tassajara Valley and in its tributary valleys; cuts are proposed on sidehill areas and on the crest of one ridge. Note that the number of ungraded areas in Phase 2 is substantially greater than was the case in Phase 1. It should be recognized that some development is proposed for lands that have previously been graded or which require essentially no grading to be developed. These include lands on the south side of Highland Road between Tassajara Creek and the urban limit line. Also included is a planned ridgecrest residential project that is west of Camino Tassajara and adjacent to the Phase 1/Phase 2 boundary.

Two grading sections have been prepared that illustrate Phase 2 grading. They are labeled Sections 2 and 3 (see Appendix B for reduced scale copies of these sections, as well as the line of section). These sections are annotated to show proposed roads, dwelling units and landscaping.

Phase 3 Grading Plan (Figure 4.2-10)

This plan illustrates Phase 3 grading. The explanation for this figure has three colors: red (cut), green (fill), and teal (previously filled area). The teal color corresponds to the area that was graded during Phase 2 earthwork. Note that in Phase 3, there is no proposed ridgecrest development. Fill is proposed to be placed on the valley floor. The noses of hills on the west side of the creek are to be in cut (contour rounding is proposed, with 3:1 gradients). There are almost no cuts proposed on the hills east of the valley floor. Windemere Parkway is a planned road connection between the Dougherty Valley project and Camino Tassajara. Grading for this road can be seen in the hillside area on the west side

of Camino Tassajara. At the Tassajara/Dougherty Valley boundary, this road is approximately 0.5 miles north of the Alameda County line. The deepest cuts in Phase 3 are on the order of 60 feet, and the fills are 30 feet thick.

Note the large extent of ungraded open space in Phase 3. Ungraded open space areas include the channel of Tassajara Creek, except for two planned road crossings (Windemere Parkway and Country Loop Road will both require culverted road crossings). Additionally, the hills overlooking the valley floor are not proposed for grading. The ungraded areas in Phase 3 also include three slide areas that are designated Single-Family Residential–Very Low Density (SV). For the purposes of Figure 4.2-10, no attempt was made to estimate the amount/nature of corrective grading to these areas, which are on the east flank of Camino Tassajara.

A grading section has been prepared that provides insight into Phase 3 grading. This section is oriented east-west and is just north of the Alameda County line. The west end of the section approximately corresponds with the location of Tassajara Creek, and it extends easterly toward the urban limit line. This section, which is labeled Section 1, is presented in Appendix B.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Significance Criteria

CEQA Guidelines (Appendix G, 1992 revised) define a significant impact on the geologic or soil environment as ". . . a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project." The guidelines also stipulate that the EIR analyze significant environmental effects the project might cause by bringing development or people into the area affected by geologic or soil hazards. Conflicts of the proposed development with *General Plan* policies are also significant impacts.

All impacts are considered significant adverse impacts unless identified otherwise. The corresponding mitigation measure(s), unless otherwise noted, would be sufficient to reduce impacts to a less-than-significant level. Although not required by CEQA, some less-than-significant impacts have been discussed because they are issues of local concern.

General Plan Compliance

General Plan policies do not provide objective design standards, but do provide policy direction. *General Plan* policy 10-29 restricts extensive grading on slopes steeper than 26 percent; 10-22 states that slope stability should be a primary consideration in the ability of land to be developed or designated for urban uses. Other policies indicate that in high risk areas, the design of projects should be sensitive to geologic constraints, and that in areas where landslide hazards cannot be adequately mitigated the lands should remain undeveloped. Furthermore, *General Plan* Policy 10-31 specifies that the County should not accept dedication of public roads in unstable hillside areas or allow construction of private roads in unstable hillside areas which would require an excessive degree of maintenance.

A factor in determining which specific lots and streets are at risk is the adequacy of the geologic/geotechnical report for the project which provides site-specific information on landslides and other hazards. The proposed grading and drainage plans can also affect the risks. For the project, the geologic/geotechnical report prepared by Engeo is satisfactory for assessing geologic hazards at a *General Plan* level of detail, and for evaluating the *Preliminary Development Plan* (full-sized grading plans submitted to the County are at a scale of 1 inch=400 feet; the contour interval is 25 feet). At this level of detail the grading concept and geologic risks can be assessed for neighborhood-sized areas, but it is not possible to conclude that the grading for a specific lot/street complies with County ordinance code standards or General Plan policies.

Similarly, it is difficult to accurately assess the hazards posed by a landslide on the basis of reconnaissance-level data and a conceptual grading plan. Preliminary opinions and conceptual grading schemes must be confirmed/refined by subsurface data and engineering analysis. During the processing of final development plans/tentative subdivision maps, more detailed geologic/geotechnical reports are required, and the grading plans accompanying those applications are typically submitted at a scale of 1 inch=40 feet with a two-foot contour interval. Consequently, this EIR can evaluate the relative suitability of neighborhoods to development and assess the general criteria for grading contained in the Engeo report and carried out in the Conceptual Grading Plan. The actual densities and lot yields achieved in neighborhoods may be less than those assumed in the Project Description. Compliance of grading and development with applicable *General Plan* goals and policies must be determined at each stage in the planning process. Grading for a particular neighborhood may "work" at a scale of 1 inch=400 feet and not be identified as an impact. Nevertheless, it must be tested for compliance with *General Plan* and Ordinance Code requirements at later stages in the planning process.

With regard to grading on slopes steeper than 26 percent, *General Plan* policy 10-24 and the voter-approved Contra Costa County Measure C (1990) are intended to restrict development on steep hillsides. These adopted policies do not prohibit grading and surface/subsurface drainage improvements necessary for the safe development. Rather, the measure implies that grading activities be "sensitive to geologic, visual and vegetative factors by minimizing the impact of such activities and avoiding the use of intrusive engineering solutions involving significant changes to landforms and the use of large walls, etc."

In summary, the *General Plan* is an appropriate instrument to direct development away from the most hazardous areas (or to recommend lower densities in such areas). Similarly, it is proper for the *General Plan* to direct development away from areas where natural slopes are predominantly steeper than 26 percent. Of the approximately 2,600 acres that are proposed for grading and development, nearly 1,000 acres are in valley floor areas. The remaining 1,600 acres of hillside lands that are to be graded fall into two categories: a) lands with slopes of 10 to 26 percent (approximately 1,360 acres) and b) lands with slopes of greater than 26 percent (240 acres).

Impact 4.2-1 Portions of the PDP may be inconsistent with *General Plan* policies restricting extensive grading of slopes greater than 26 percent and slope stability.

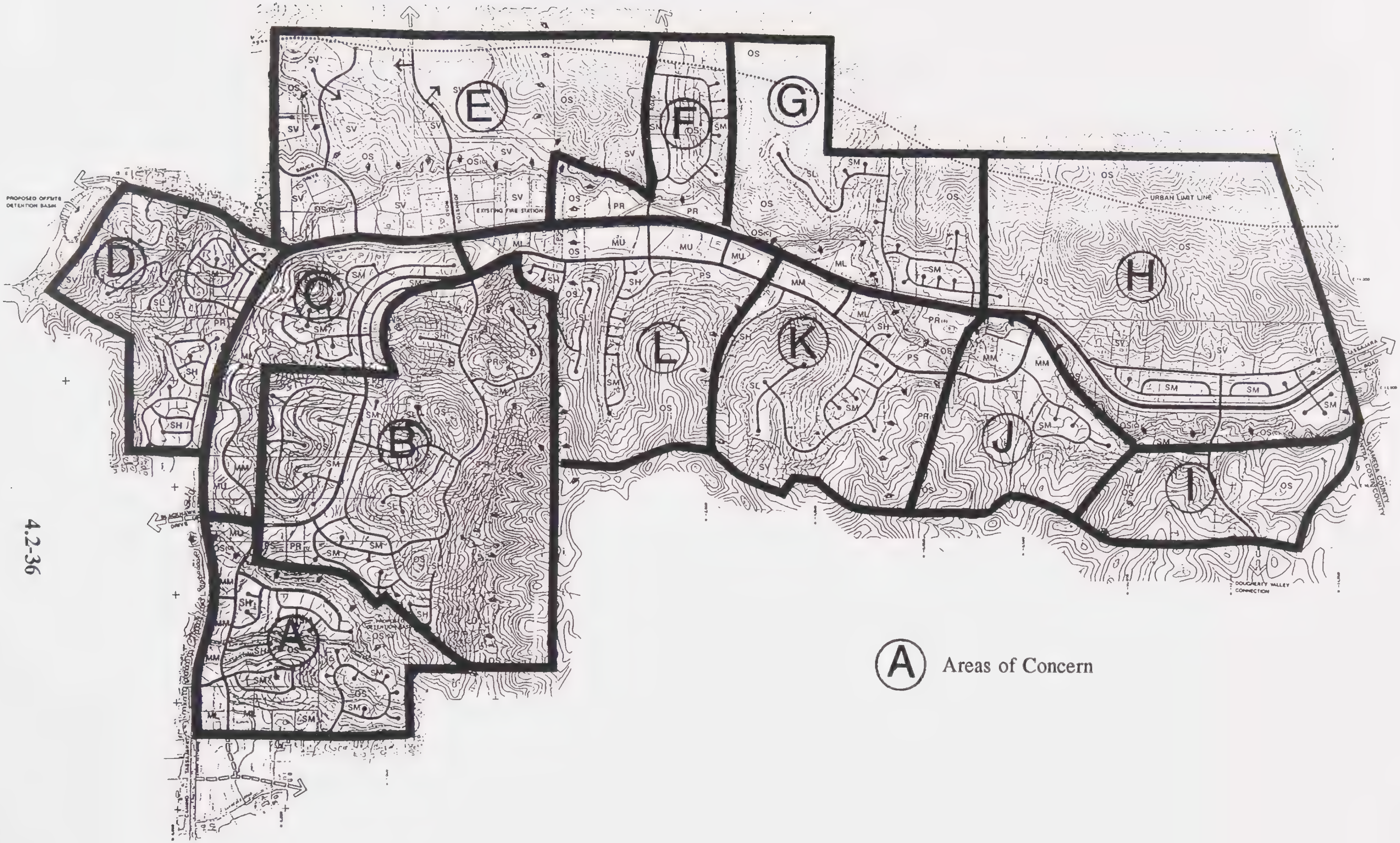
The *Preliminary Development Plan* attempts to concentrate development, while leaving an estimated 57 percent of the site as permanent open space. Most open space is integrated into large parcels that include the highest ridgecrests on the perimeter of the Tassajara Valley. The Preliminary Development Plan provides an estimated 2,688 acres of open space (including parks). The portion of the project site which possesses slopes of 26 percent or steeper totals approximately 1,810 acres. To accommodate the Tassajara project an estimated 2,115 acres of land would be graded. Of this total, 470 acres of land possessing slopes of 26 percent and greater would be graded. Of this total, development is shown on 251 acres. The remaining 219 acres that would be graded represents hillside areas to be retained as open space. According to the PUD Plan, such areas would be contour-rounded and revegetated. Most of the heavy grading occurs in the interior of the project (e.g., areas labeled B, L and K in Figure 4.2-11) where it is necessary to achieve long-term stability. The overall approach of the project appears consistent with Policy 10-29. Nevertheless, there are two areas on the fringe of the project site where grading of steep slopes may be inconsistent with Policy 10-29. There are approximately 26 acres of land with slopes of greater than or equal to 26 percent that are proposed for grading and development in Area D (Figure 4.2-11), where the ridgecrest is to be lowered by 70 feet. The approach to grading of this area, which is on the northern edge of the property, may be incompatible with the sensitive approach to grading specified by the *General Plan*.

With regard to geology and slope stability policies 10-26, 10-30 and 10-32, there are three development areas labeled SL on the east side of Camino Tassajara, in Area H (Figure 4.2-11). These areas are mapped as massive slides by Engeo, Inc. (see Figure 4.2-4). There may be developable land, but the developable area may be much smaller than shown on the *Preliminary Development Plan*. These areas currently contain very low-density residential lots which were developed without evaluation of the stability of the slide areas. These development areas are not planned for grading as part of the current Tassajara project, but the dwelling unit count shows future residential lots in this area. The geotechnical data accompanying the application does not include subsurface data from this portion of the planning area. Additional design level geotechnical exploration would be required prior to development in this area. A concern about this areas is the potential for grading, the increased irrigation of yards, removal of vegetation and increased impervious areas to reduce the stability of the existing slides. Moreover, corrective grading of the slides to achieve long-term stability may not be economically feasible.

Mitigation Measures

The following mitigation measures are required to reduce the impact of General Plan inconsistency to a less-than-significant level.

4.2-1(a) *Substantially reduce the lot yield in Area D (Figure 4.2-11) to provide flexibility needed to reduce grading, and apply the "hillside guidelines" and "supplemental hillside guidelines" to this portion of the site.*



Source: Mills Associates

Figure 4.2-11 Development Areas Showing Grading Concerns

4.2-1(b) *Three development areas labeled SV on the east side of Camino Tassajara in Area H (Figure 4.2-11) should be shown as open space on the General Plan and Preliminary Development Plan unless the developable area can be more accurately identified by geologic/geotechnical studies.*

Conceptual Grading Plan

Impact 4.2-2 Development of the proposed project will require mass grading of hillsides to create stable areas suitable for development.

According to grading plans prepared for this project, approximately 2,115 acres would be graded. The grading plan strives to create safe, usable development areas. This objective is attained by mass grading of most lands proposed for development, along with adjacent open space land on the perimeter of the development, with large, integrated open space areas at higher elevations on the site (chiefly on the east and west sides of Tassajara Valley). The plan also shows permanent open space along the channels of Tassajara and East Branch creeks, and two detention basins are proposed. Within the development, open space is provided by a golf course, wildlife corridors and water quality basins/grassy swales. Figures 4.2-8 through 4.2-10 shows the anticipated limits of grading. Because the grading plan was developed using a 25-foot contour interval, these maps should only be considered approximate. Given the long-term nature of this project, the details of the grading may be subject to refinement as information on geology evolve, and as development concepts are finalized.

Figures 4.2-8 through 4.2-10 also show lands that have been assigned a residential land use designation, but are not currently proposed for grading. Some of these areas are partially built out. If the *General Plan* amendment is approved, the holding capacities would allow considerable additional development. In other areas the project proponent is assuming that no significant grading is needed to generate units. For example, no grading is shown in Phase 4. Five additional points that should be made are:

- Grading is proposed outside the project area but within the urban limit line (ULL) on the Brown property. The project proponents assert that the boundary of the Tassajara project site does coincide with the urban limit line at this location.

- Grading is not shown for water reservoirs or their maintenance roads. Other infrastructure (e.g., sewage pipelines, pumping plant, alternate access to Dougherty Valley) may also require hillside grading. The location of these facilities has not yet been established.

- In the Visual Quality section, Figure 4.8-27 identifies two prominent hillside areas proposed for grading. It is recommended in Mitigation Measure 4.8-4(a) that development of these areas be prohibited because of their visual impact. With regard to geologic factors, it appears that stable building sites could be created. There is a question as to whether the amount of hillside grading is "excessive," in which case the two hillside areas conflict with Safety Element policies 10-24 and 10-29. That determination rests with the Board of Supervisors.

- Slide areas in open space lands which pose a threat to future development will require corrective grading.

- Prior to processing final development plans/tentative maps, additional geotechnical analysis will be required.

As proposed, the grading will be done in stages, as development occurs (i.e., grading of Phase 1 will be done in increments, over a period of several years). Because some land development projects will generate a cut/fill imbalance, there are situations where two projects will be graded concurrently. Conceivably, a development area may be partially graded (used either as a borrow area or as a receiver site for fill), prior to the processing of a tentative map on the balance area. Unless effective erosion control measures are implemented and regularly maintained, the balance area could generate dust, as well as be a source of erosion and sedimentation problems. The volume of cut and fill for the total project has not been estimated. Nevertheless, it is clear that overall grading for the entire project site can be balanced within the Tassajara project area (see Figures 4.2-8 through 4.2-10).[5] Cross-sections have been prepared by the applicant to illustrate the grading concept. Reduced scale copies of two of these sections are presented in Appendix B.

The geologic/geotechnical report prepared for this project by Engeo, Inc. includes general recommendations and criteria for site grading, drainage and foundation design. In effect, these are mitigations proposed by the project sponsor to keep grading-related impacts to an acceptable minimum. They are prudent recommendations which represent good engineering practice. More specific grading recommendations are to be provided with the processing of tentative subdivision maps. The following list is to highlight, not supersede, the measures contained in the Engeo report:

- The more expansive soils and bedrock should be placed at the bottom of deep fills.

- All fills should be adequately keyed into firm, natural material unaffected by shrinkage cracks.

- Subsurface drainage systems should be installed in all keyways, and in swales which are filled.

- Areas to receive fill should be properly prepared to ensure moisture between the native earth materials and engineered fill.

- Slope gradients of engineered slopes are to meet the following standards:

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5 More detailed grading plans will be submitted when final development plans and tentative maps are processed. It is reasonable to assume that civil engineers for these projects will adjust pad elevations to balance grading or closely approach a balance for specific projects. However, there are some hillside development areas that will generate a surplus of cut. For these projects, balance areas on the valley floor are essential.

Fill Slopes		Cut Slopes	
Height	**Gradient**	**Height**	**Gradient**
8'<	2:1	4'<	2:1
8-50'	3:1	4-70'	3:1
>50'	3.5:1	>70'	3.25:1
buttress	2.5:1		

- Where steeper slopes are desired, supplemental stabilization techniques may be required (e.g., reinforced earth, retaining walls).
- Buttress fills should be constructed at the toes of all major cut slopes and slide areas which abut development areas.
- Where liquefiable sediments occur along the edges of Tassajara Creek, stabilization methods should be implemented.
- Geotechnical engineer and engineering geologist should monitor earthwork.
- Criteria are provided for a) compaction of fills, b) foundation systems, c) surface drainage, d) retaining walls, e) pavement design.
- Methods to control erosion of slopes are identified as surface drainage improvements, erosion control planting, hydroseeding, and in some cases installation of jute matting.

Mitigation Measures

All of the following mitigation measures are required to reduce the impact of mass grading to a less-than-significant level.

4.2-2(a) *Gradient criteria for cut and fill slopes as recommended by Engeo should be required of future applications when developing the project site. Any conflicts between the future grading plans and these criteria should be interpreted as evidence that the plan is inconsistent with grading criteria for the project.*

4.2-2(b) *Residential unit(s) at the toe of a slope which result in high cut slopes, or which reduce the stability of a broad area upslope, should be carefully analyzed for General Plan consistency during processing of the final development plans. Alternatives to such grading should be evaluated (e.g., split level pads; custom-designed hillside homes with grading limited to the footprint of the foundation area and driveway; reduced lot yield, etc.).*

4.2-2(c) *Any grading which is proposed on a parcel prior to recording a final subdivision map (e.g., balance areas) should be reviewed to ensure it does not conflict with the planning options for the site, and that graded area is stabilized and protected from erosion.*

4.2-2(d) *Grading within open space lands should be contour-rounded to mimic natural terrain features, mantled with topsoil and revegetated.*

Fault Ground Rupture

Impact 4.2-3 Faults on the site have potential to cause significant damage to improvements.

Geologic structure in Contra Costa County is dominated by active northwest-trending, right-lateral, strike-slip faults, including the Hayward, Calaveras, Concord and Greenville faults. No known active fault traverses the site. However, there are numerous thrust faults and blind thrusts[6] mapped in the Diablo Range, some of which traverse the Tassajara property (see Figures 4.2-4 and 4.2-5).

The Alquist-Priolo Earthquake Fault Zones Act of 1972, which requires detailed geologic studies prior to development for sites near faults with proven Holocene surface fault rupture, does not apply to these thrust faults and blind thrusts. Although these faults lack definitive evidence of Holocene displacement, there is an emerging body of evidence that they are capable of generating moderate to high magnitude earthquakes. Recent California earthquakes on thrust faults and blind thrusts include the San Fernando earthquake (1971, M6.4), Coalinga earthquake (1983, M6.5), Whittier Narrows earthquake (1987, M5.9), and Northridge earthquake (1994, M6.6). None of these faults were regarded as active (or capable of generating a damaging earthquake) prior to the seismic event. And while the recurrence interval of significant earthquakes on these faults is/may be much less than the recurrence interval of the San Andreas, Hayward and Calaveras faults, earthquakes of thrust faults in California have accounted for billions of dollars in damage, as well as loss of life and injuries. In the case of the San Fernando earthquake, surface fault rupture was confirmed. In the other cited earthquakes, the fault did not reach the ground surface, although the ground shaking did result in some co-seismic ground failure (e.g., landslides, ground cracks, liquefaction).

Although the risk of fault rupture is remote, and faults on the site are not considered active by either the U.S. Geological Survey or California Division of Mines and Geology, additional information is needed to confirm the interpretation of these agencies. Furthermore, sheared rocks in fault zones may present special engineering problems that could affect slope stability and/or foundation design.

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6 Blind thrusts do not reach the earth's surface. Earthquakes on blind thrusts are capable of causing co-seismic deformation (arching of strata, uplift and ground cracks), as well as strong ground shaking. Convergence of the North American and Pacific Plates, which is estimated to be in the range of 1.8 to 3.0 mm/yr, may be responsible for thrust faults in the Contra Costa County area.

Mitigation Measure

4.2-3 *The design level geotechnical and geologic studies, which are a normal part of the subdivision process, should include investigation aimed at providing information on the location, width, engineering character and activity status of faults which traverse lands proposed for development.*

Earthquake Ground Shaking

Impact 4.2-4 Strong to violent earthquake ground shaking on active fault zones in the region could cause significant damage to improvements, and in extreme cases, loss of life.

The project area is located approximately 4.5 miles northeast of the mapped trace of the active Calaveras fault and 3.5 miles northwest of the active Greenville fault (Crane, 1988) (Figure 4.2-3). Historic records of the intensity of ground shaking that accompanied large earthquakes in the San Francisco Bay region have been used to assess regional intensity of ground shaking likely to result from future large earthquakes, such as along the San Andreas, Hayward and Calaveras fault zones. The ground shaking accompanying such earthquakes has primary and secondary effects. Primary effects of shaking are those that directly affect improvements. Secondary effects of shaking are indirect effects on improvements resulting from the effects of shaking on earth materials. Secondary effects are of special concern in the project area because of the characteristics of the bedrock and the presence of landslides. The secondary effects of earthquake ground shaking include the potential for seismically induced landsliding and settlement, including liquefaction of relative clay-free sands near the channels of Alamo and Tassajara creeks and their major tributaries.

Earthquake ground shaking could result in significant damage to improvements and, in extreme cases, loss of life, either from the primary or secondary effects of shaking, including possible seismically-induced landsliding, differential compaction and/or settlement.

Mitigation Measures

All of the following mitigation measures are required to reduce the impact of ground shaking damage to a less-than-significant level.

4.2-4(a) *Submit an analysis of the liquefaction potential for alluvium on the valley floor areas with applications for approval of final development plans. The analysis should be especially rigorous for lots on the perimeter of major creek channels. The methodology, sampling and other procedures should be designed after consultation with the County geologist. Where liquefaction potential is found to exist, this hazard should be mitigated or the land affected should be retained as open space on the project.*

4.2-4(b) *Appropriate grading and design should be used to reduce the secondary effects of ground shaking to structures and infrastructures. Cut-and-fill slopes should be*

designed to enhance stability of the site under seismic conditions. Measures to reduce the potential significant impacts of the secondary effects of ground shaking include: 1) slope inclinations consistent with the recommendations of the Engeo report, justified by stability analysis at the time of the design-level geotechnical investigation; 2) removal or repair of landslides underlying proposed lots which have the potential to affect downslope project improvements; and 3) installation of subsurface drainage.

4.2-4(c) *Engineered retention structures and surface and subsurface drainage improvements should be used to improve the stability of potentially unstable colluvium not entirely removed in cut slopes. Engeo proposes use of buttress fill debris benches at the toes of all major cut and fill slopes. These buttresses provide a necessary buffer between open space and developed lots (see Figure 4.2-12).*

4.2-4(d) *Engineered fills on the project site should be properly designed with keyways and subsurface drainage, and adequately compacted (i.e., minimum 90 percent relative compaction as defined by ASTM D1557) to significantly reduce both seismically induced and natural fill settlement.*

4.2-4(e) *All roads, structural foundations and underground utilities should be designed to accommodate estimated settlement without failure, especially across transitions between fills and cuts.*

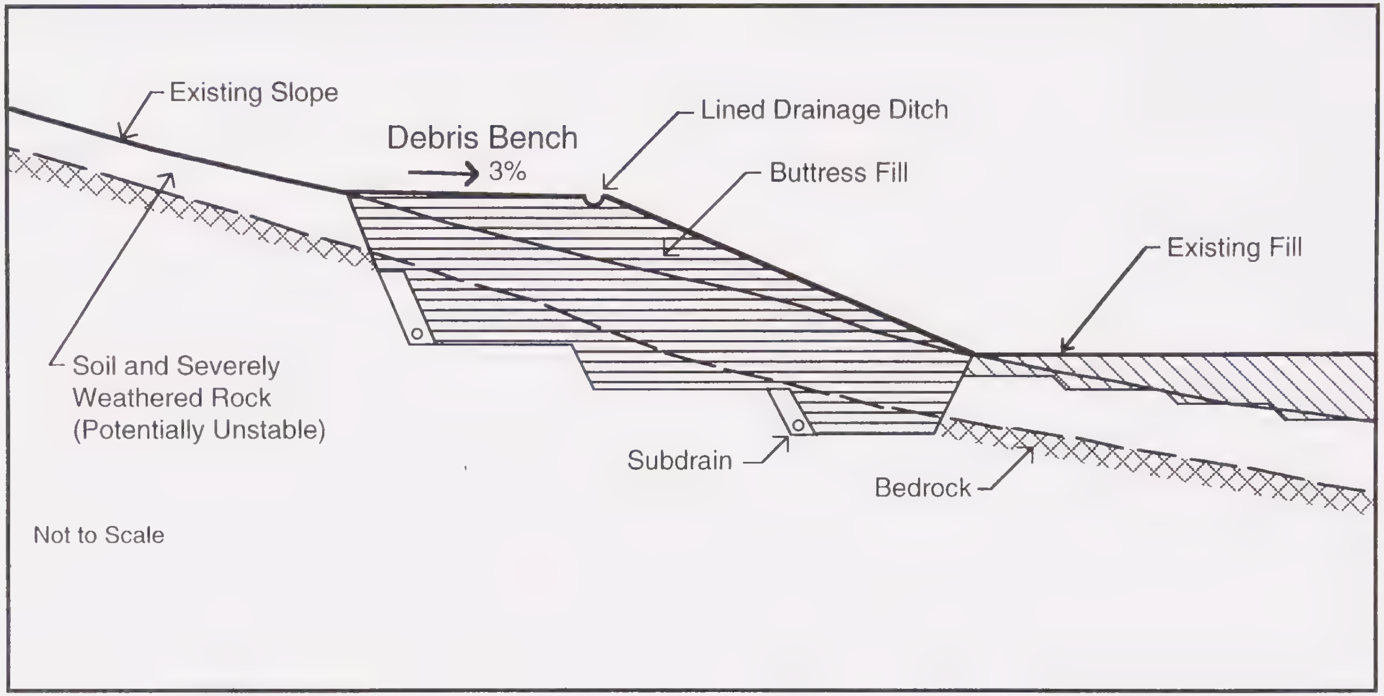
4.2-4(f) *Final design of the proposed improvements should be made in conjunction with a design level geotechnical investigation submitted to the County for review prior to issuing any permits. This investigation should incorporate stability analysis of both existing and reconstructed project area slopes.*

4.2-4(g) *Project area slopes should have a factor of safety greater than 1.1 under pseudostatic conditions (i.e., assuming maximum possible groundwater levels during the life of the project and earthquake shaking).*

Slope Stability

Impact 4.2-5 Landslides on the site have the potential to cause significant damage to improvements and, in extreme cases, loss of life.

Landslides (primarily earthflows) were mapped in the project area by previous published and unpublished site-specific studies (Nilsen, 1975; Majmundar, 1992; Engeo, 1993). Mapping for this document indicates landslides are extensive in the project area (Figure 4.2-4). Previous reconnaissance mapping supplemented by limited subsurface exploration (Engeo, 1993) confirmed approximately 350 landslides on the site, suggesting that landsliding primarily involves surficial materials, although older, dormant bedrock slides are present in the area. Debris flows, slumps and slump flow complexes are mapped on-site, although earthflows are more typical. Earthflows and debris flows tend to be relatively shallow. Slumps and slump flow complexes are rotational and may extend into bedrock.



Source: Darwin Myers Associates

FIGURE 4.2-12 SCHEMATIC OF DEBRIS BENCH

Slope stability is a potential hazard where slides are mapped within, or immediately adjacent to, areas planned for development. Because debris flows are fast moving slides, they are a hazard whenever they overlook areas planned for development.

A total of 63 debris flows were confirmed within the planning area. According to Campbell (1975), acceleration of debris flows is uncommon on slopes of less than 26 degrees (49 percent slope). In the Tassajara project area, debris flows commonly "toe out" on slopes of 13 degrees (23 percent), and only about one-fourth of the mapped debris flows toed out on slopes flatter than 11 degrees (19 percent). Interpretation of aerial photographs of the Tassajara project area indicate that debris flow deposits do not significantly run out into lowland valleys. It is unclear how remediation of specific debris flow areas will be handled. Some will be eliminated during mass grading. The Engeo report indicates a combination of remedial measures are available to control this hazard, including subdrainage of colluvium filled swales, debris fences, diversion walls, debris basins and impact walls.

Earthflows, slumps and slump flow complexes are much slower moving than debris flows. Within the development area, slides would be removed/stabilized. The details of the repairs would be a part of the design level geotechnical and geologic investigation. Such slides in the open space area do not pose an injury or loss of life hazard. Moreover, a proposed buttress fill on the perimeter of the developed area will provide maintenance access for men and equipment. Slides which reach or closely approach the buttress would be repaired as needed.

The geotechnical report is not explicit regarding the design of buttresses, retaining walls and landslide repairs in general or other improvements.

Mitigation Measures

All of the following mitigation measures are required to reduce the impact of potential landsliding to a less-than-significant level. One or more of the listed approaches should be selected by the project geotechnical engineer, as appropriate, on the basis of the site-specific, design-level geotechnical investigation.

4.2-5(a) *The design-level geotechnical report must address the impacts of slope instability with respect to planned improvements. These can be significantly reduced or, in many cases, prevented by recognition of the conditions, and by one or more of the following, as appropriate to specific areas of the site:*

- *specific improvements to remove/stabilize landslides and areas of creeping soils within or affecting proposed lots. Where corrective grading is not economically feasible or environmentally acceptable planned improvements must be set back from those areas;*

- *impact deflection or catchment structures below unmitigated landslide or swale areas; and appropriate foundation design.*

4.2-5(b) *A design-level geotechnical and geologic investigation report should be submitted to the County with subdivision applications. These reports must address the debris flow potential and the need, if any, for debris catch basin(s), deflection structures, building setbacks or other measures in areas of debris flow potential. Current research on the landslide hazard potential of colluvium-filled swales indicates that surface and subsurface drainage is effective in preventing landslides.*

4.2-5(c) *In areas of development on, or adjacent to, existing landslides, slope repairs should include removal of unstable or compressible slide debris, excavation into underlying competent bedrock, construction of subsurface drainage measures, replacement with compacted engineered fill, construction of surface drainage measures, and planting with erosion-resistant vegetation, as recommended in the design-level geotechnical investigation report.*

4.2-5(d) *Surface drainage control measures should be incorporated for any areas of remedial work associated with slope repairs.*

4.2-5(e) *The design-level geotechnical and geologic investigation submitted with individual tentative subdivision maps must clarify the proposed mitigation of landslide hazards, and address how improvements at the toe of slides will stabilize upslope areas.*

Impact 4.2-6 The potential failure of proposed cut-and-fill slopes could cause significant damage to improvements.

Adequate cut-slope stability can be achieved primarily by adapting slope inclination to local geologic conditions. The Uniform Building Code (UBC) and County Grading Ordinance standard for both cut and fill is a gradient of 2:1 (horizontal to vertical). This standard for cut slopes has proven unsuccessful in bedrock materials similar to those that occur on the Tassajara project area. Danville has enacted a requirement for 3:1 slopes, and many recent large projects in the area have been developed using 3:1 cut slopes. Contra Costa County Measure C (1990) is designed to regulate development on slopes steeper than 26 degrees (2:1), in part because of the unsatisfactory performance of man-made 2:1 slopes in many areas of the County. Slaking and swelling of clayey bedrock upon exposure to air in cut slopes may destabilize seemingly stable slopes, a process locally observed in bedrock materials similar to those in the project area. The bedrock material in the project area can be expected to undergo accelerated weathering when exposed to air and surface runoff. Oversteepened slopes can be expected to show evidence of sloughing and erosion in as little as 10 to 15 years. Similarly, testing of fills indicate that they lose strength as they weather, and over the long-term 2:1 fill slopes may not perform satisfactorily.

Slope stability analyses are needed for proposed engineered slopes as well as for shallow and deep landslides within or adjacent to developed areas. Of particular concern are large, deep-seated slump flow complexes mapped by Engeo on the west-facing slope overlooking the proposed Tassajara South and Mid-Valley East communities (see Figure 4.2-4). The two largest slides in the Tassajara South community are 11 and 23 acres. The largest slide in the Mid-Valley East community is 35 acres. In each case, the slides extend into open space, and lands on the valley floor which are planned for development are at the toe of these slides. Several other portions of the project call for construction of residential

development adjacent to marginally stable open space areas. Open space that is pockmarked with landslide scars is likely to be highly sensitive to the grading and development concept. A well-conceived development concept that is sensitive to geologic constraints (not lot yield) offers the best opportunity for successfully integrating residential development and major open space areas.

Mitigation Measures

All of the following mitigation measures are required to reduce the impact from failure of cut and fill slopes to a less-than-significant level.

4.2-6(a) *Use of 2:1 gradients is restricted to fill slopes less than eight feet in height, and cut slopes less than four feet in height. Buttress fills, which are typically less than 20 feet high, and which do not support proposed dwellings, are allowed to have gradients of 2.5:1. All other engineered slopes in the project are to have gradients ranging from 3:1 to 3.5:1, depending on the slope height and nature of the material (bedrock or fill).*

4.2-6(b) *A slope stability analysis should be required in the design-level geotechnical report as the development potential of lands in the toe area of large landslides is unproven. This stability analysis is needed to support the assertion that buttresses are viable options for mitigation of potential movement near the toe of large, deep-seated landslides that extend into open space.*

4.2-6(c) *The approach to grading and development of the residential units should be to improve the stability of the open space lands by corrective grading of landslides, drainage improvements and revegetation of disturbed areas, in areas where development is adjacent to either steep slopes or hillsides which exhibit evidence of instability. Making cuts in the lower portion of a marginally stable hillside should be avoided.*

4.2-6(d) *A Geologic Hazards Abatement District (GHAD) or other entity (e.g., County Service Area or financing district) should be established. This will ensure efficient long-term abatement of geologic hazards, maintenance of drainage facilities and removal of sediment from debris catchment areas. The GHAD should be funded through property tax assessments, and governed by a plan of control.*

4.2-6(e) *The Biological Resources section contains a mitigation measure which calls for unlined drainage channels in all wildlife corridors. (The general location for these facilities are shown in Figure 4.4-4.) It is important that the design of these channels, some of which run along the toe of slope, are designed so that they do not conflict with mitigation measure 4.2-6(c). The final design should incorporate the recommendations of the geotechnical engineer, and should be such that the maintenance requirements are kept to a practical minimum.*

Impact 4.2-7 Potential vertical and lateral movement of fills could cause significant damage to improvements.

Fills up to approximately 70 feet thick are proposed for the project. Technical literature indicates that even engineered fills that are properly compacted can experience vertical movement (settlement as the fill experiences consolidation; swelling as the fill gradually become saturated). Fills made chiefly with highly expansive soils and bedrock are likely to experience significant post-construction movement. The potential for these problems is much less when moderately and non-expansive fill materials are used.

Lateral deformation of fill generally occurs near faces of high fill slopes which are constructed of expansive materials. Such deformation typically occurs after the fill is subjected to long-term irrigation.

Some fills in the project are proposed in narrow upland valleys. Single-family lots in such areas may have a differential fill thickness of more than 10 feet, or be located at a cut-fill transition. Residences on such lots could experience damage due to differential settlement.

Mitigation Measures

All of the following mitigation measures are required to reduce the impact from vertical and lateral movement of fills to a less-than-significant level.

4.2-7(a) *As recommended by the applicant's geotechnical consultant, selective grading should be used to construct major fills. Materials with the highest expansive potential should be placed at depth with materials of low to moderate expansion potential reserved for use in the upper portion of the fill.*

4.2-7(b) *Where placement of fill over compressible material is expected to cause an unacceptable amount of compression, the compressible material should be removed to a depth sufficient to mitigate fill settlement.*

4.2-7(c) *Where tolerance for lateral deformation of a fill is low, the applicant's geotechnical engineer should provide special design recommendations that are sensitive to specific site conditions (e.g., geometry of fill slope, composition of the fill, planned location of improvements and other factors). Reinforced earth has been successfully used to control problems of this type.*

4.2-7(d) *Where the differential thickness of fill exceeds 10 feet, over-excavation methods should be used to create uniform foundation conditions. The over-excavation requirements should be provided in the design level geotechnical report.*

4.2-7(e) *For cut/fill transition lots, three feet of over-excavation should be used to make the transition more uniform as recommended by the Engeo report. This subject should be reviewed in the design level geotechnical report.*

4.2-7(f) *The design-level geotechnical report should include settlement analysis for each major fill. The report should also provide a specific analysis for differential vertical movement of building areas where fill thickness varies by more than 10 feet; for cut/fill transition lots; and provide analysis of lateral movement for lots at the edge of proposed fill slopes. It should also provide specific standards and criteria for selective grading of major fills.*

4.2-7(g) *The design-level report should provide a plan for long-term monitoring of settlement/ swelling and lateral movement of major fills. The engineers for the project should establish monuments in fill areas, especially ravine fills. Monitoring is to commence with the completion of rough grading and continue throughout development of all lots in that phase of the project. Delay construction of residential lots on ravine fills until the final stages of a particular phase.*

4.2-7(h) *Fills should be limited to a maximum thickness of 75 feet, because the behavior of deeper fills is less well understood and, hence, less predictable.*

Erosion and Sedimentation

Impact 4.2-8 The proposed project involves cuts and fills on moderately steep slopes, with a potential to cause significant erosion of unprotected slopes, and downslope sedimentation both on and off-site.

There are multiple facets to the subject of erosion and sedimentation. Erosion control requires implementation of measures after major earthmoving activities are completed. Sediment control requires working in a situation where the soil is continually being disturbed.

Erosion control requires use of techniques which prevent displacement of soil particles by raindrops, moving water or wind. These techniques include erosion control blankets, mulching and establishing vegetation. Sediment control requires the removal of particles which are suspended in moving water, along with having a knowledge of drainage control. Neither of these potential impacts are easily mitigated, and both require an understanding of the limitations of "Best Management Practices" (BMPs). Erosion and sedimentation are natural geologic processes which do not conflict with protection of resource values. The problem arises when grading activities result in increased sediment yields that exceed historic conditions. Techniques to reduce sediment from runoff waters include the following:

- restrict the amount of land disturbance;
- keep graded slopes as flat as possible;
- restrict grading to the dry summer season;
- implement BMPs to control erosion and minimize the discharge of sediment into creek channels.

There is a mistaken belief that placement of barriers (silt fences, straw bales) are an efficient method to control sediment from exiting the graded area and entering a natural drainage channel. These barriers are ineffective when runoff waters overtop, tunnel under or flow around the barriers, which is an all too often occurrence. As a result, drainage control is important and sediment traps/basins are a vital component of sediment control. To be effective, they must be designed in accordance with the principles

of physics (i.e., viscosity, terminal velocity, Stokes Law). The following criteria should be used to size sediment traps/basins:

- Design the basin using peak runoff from a 5- or 10-year storm.
- Design the containment system around a specific size soil particle to be removed from moving waters. EPA recommends that particles .02 mm. or larger be trapped.
- Provide a long flow path length to ensure the greatest possible opportunity for sedimentation to occur.
- Calculate the anticipated sediment yield from a 10-year storm, and provide sufficient storage capacity in the basin to accommodate this volume of sediment.
- Include a gravel filter in the sediment trap/basin to allow waters to flow through and drain the structure.
- Design the depth of the sediment trap/basin a minimum of at least two feet.
- Provide for maintenance of facilities throughout the winter rainy season to ensure effective sediment control measures.

<u>Mitigation Measures</u>

Since the proposed project would involve significant grading, mitigation measures are required for both: 1) construction-related, short-term erosion and sedimentation; and 2) long-term erosion and sedimentation. For construction-related, short-term impacts, one or more of the listed approaches would be selected by the project engineer as appropriate, on a site-specific basis within the project area. For long-term impacts, mitigation measures 4.2-8(d) through 4.2-8(g) are required.

4.2-8(a) *Grading activities should be restricted to the summer construction season (15 April through 15 October). Any earthwork done after 15 October should be limited to activities directly related to erosion control.*

4.2-8(b) *The applicant should provide an erosion control plan prior to approval of the grading plan. The following interim control measures should be employed based on site-specific needs in the project areas:*

- *grading to minimize areas of exposed, erodible material, and to avoid over-concentration of rapidly flowing runoff in unprotected, erodible areas;*

- *the erosion control plan should include water bars, temporary culverts and swales, mulch and jute netting blankets on exposed slopes, hydroseeding,[7] silt fences, and sediment traps/basins;*

- *placement of stripped topsoil on graded slopes prior to the onset of winter rains;*

- *because the biggest problem with effective sediment control is lack of maintenance, the erosion control plan must have a comprehensive program for inspection and maintenance during the winter rainy season, including provisions for documenting maintenance activities;*

- *wherever feasible, isolate runoff from ungraded areas, thereby simplifying erosion control and sediment control measures within the graded area;*

- *monitor the effectiveness of the erosion control measures throughout the duration of construction. Specifically, include a program to assess the effectiveness of erosion control measures by monitoring Tassajara Creek and the East Branch of Alamo Creek. For example, there is an existing commercial fish pond on Alamo Creek, downstream from the Tassajara project area. If access to this property could be secured, water quality sampling and monitoring of sedimentation rates would provide a basis for determining if the measures being implemented were adequate, or if the plan needed to be refined and improved.*

4.2-8(c) *Where earthwork is proposed in the channel of Tassajara Creek or the East Branch of Alamo Creek, biotechnical slope stabilization measures should be employed (or integrated with engineered structures) to control erosion.*

4.2-8(d) *In order to reduce the potential impacts of long-term erosion and sedimentation, the project should incorporate the appropriate design, construction and continued maintenance of one or more of the following long-term control measures. The specific measures should be based on the recommendations of the project geotechnical engineer and hydrologist.*

- *Construction of sediment traps/basins and grassy swales at strategic locations to control sediment.*

- *Revegetation and continued maintenance of graded slopes, either by a GHAD, homeowners association or maintenance district. Special care should be taken for slopes nearest creek channels.*

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7 Technical literature indicates that successful hydroseeding for erosion control requires care in selection of species. Some species of annual grasses are ineffective for erosion control. The Biological Resources section, mitigation measure 4.4-1(e), also points on the importance of selecting native and non-native species that are compatible with the existing vegetation in the area.

- *Construction of drainage ditches or buttress fills above the developed area, and integration of the ditches with the existing and planned storm sewer systems.*

- *Provide closed downspout collection systems for individual structures.*

- *Design cut and fill slopes to minimize, as much as possible, the velocity of sheet flow runoff.*

- *Provide periodic inspection and maintenance of both individual (lot) and common (project) erosion and sedimentation control facilities.*

4.2-8(e) *Project plans should incorporate drainage measures to collect and control surface runoff water on sloping lots, including lined ditches and closed downspout collection systems.*

4.2-8(f) *Concentrated runoff should not be permitted to drain over cut or fill slopes.*

4.2-8(g) *The proposed location of lined drainage ditches should be specified on the development plan accompanying the design-level geotechnical investigation report, which should be reviewed by the County.*

Expansive Soils and/or Bedrock

Impact 4.2-9 Expansive soils and/or bedrock have the potential to cause significant damage to foundations, slabs and pavements.

Expansive soils (those with a high shrink-swell potential) are described and mapped in the project area by the Soil Survey of Contra Costa County (Welch, 1977), and confirmed by Engeo, Inc. (1993). The Engeo report permits use of expansive native soils as fill, but does not provide specifications and standards for the thickness of non-expansive soils to be placed to achieve finished grade. Moreover, the occurrence and distribution of expansive bedrock within the Tassajara project area is not described.

Damage from expansive soils and/or bedrock is one of the most widespread and costly problems in the San Francisco region. The significant effects of expansive soils and/or bedrock can be mitigated by recognition of the condition and appropriate design. Mitigation measures involving the use of adjustable foundation systems are not generally effective against the effects of regional wet/drought cycles, and are considered undesirable because the systems require periodic maintenance. Subsurface drainage alone is also not generally effective against the effects of regional wet/drought cycles. Highly expansive soils have severe limitations for use in engineered fill.

Mitigation Measures

The following mitigation measures are required to reduce the impact of expansive soils and/or bedrock to a less-than-significant level.

4.2-9(a) *The design-level geotechnical investigation should provide criteria for foundation of pavement design developed in accordance with the Uniform Building Code (UBC) and County Code requirements on the basis of subsurface exploration and laboratory testing. The constraints on the use of expansive soil near finish grade should be evaluated in the design-level geotechnical investigation report.*

4.2-9(b) *Foundation design should include drilled-pier and grade-beam foundations, reinforced slabs and thicker pavement sections designed using criteria provided by the design-level geotechnical investigation.*

Grading for Infrastructure

Impact 4.2-10 The proposed project would result in significant grading in unstable/marginally stable areas for domestic water reservoirs, pipelines, and variety of urban services needed to serve the community.

Water (and possibly wastewater and recycled water) distribution, pumping, storage, and collection facilities are planned for locations on or near unstable lands that may be subject to landslides, shrink-swell and other geologic hazards. Most of these facilities are planned for areas that would be mass graded and stabilized for development. However, certain water storage reservoirs and water lines are planned for locations on undeveloped open space lands that may be subject to faulting, slope instability, landslides and related geologic constraints. Unstable earth conditions could cause damage to potable water, wastewater, or recycled water infrastructure, disrupt services and cause a potential threat to the safety of people.

Mitigation Measures

All of the following mitigation measures are required to reduce the infrastructure grading impacts to a less-than-significant level.

4.2-10(a) *The project proponents should design all potable water, wastewater and recycled water infrastructure to be located on undeveloped open space based on a grading plan and engineering geotechnical study prepared as part of the design level grading plan studies for the project. These plans should be prepared prior to processing the first tentative subdivision map for the project. The grading plan should be reviewed and approved by an engineering geologist acting on behalf of the County prior to the County's approval of the Development Plan for the affected property.*

4.2-10(b) *A design level geotechnical and geologic report should be prepared concurrent with the design level grading studies. This report should be subject to review and approval by an engineering geologist acting on behalf of the County.*

4.2-10(c) *Water reservoirs should be constructed on competent bedrock. The construction of reservoirs on highly weathered or sheared rock should be avoided. Construction of reservoirs astride a cut/fill transition should also be avoided.*

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4.3 FLOOD HAZARDS/DRAINAGE/WATER QUALITY

INTRODUCTION

Jurisdictional Authority

The implementation and maintenance of regional drainage facilities in the County is within the jurisdiction of the County Flood Control and Water Conservation District (hereinafter Flood Control District), which has adopted plans for most urbanized watersheds in the County. The basic unit for storm drainage planning is a watershed whose boundaries do not coincide with political boundaries. Consequently, much flood control planning of the District serves both cities and the unincorporated area.

Historically, the method used to fund regional drainage facilities is a fee paid by new construction projects, with the dollar amount of the fee directly proportional to the amount of impervious surface created. The process to implement regional drainage facilities is normally initiated by the property owners who are experiencing a flooding problem, or a coordinated city/county effort.

The establishment of a drainage area is a mechanism to provide needed drainage improvements. The first step in the process is for the Flood Control District to analyze the hydrology of the watershed and identify deficiencies in existing drainage improvements. According to District standards, watersheds of 1 square mile or greater but less than 4 square miles must be designed to contain peak runoff from a 25-year storm with sufficient freeboard[1]; for watersheds of 4 square miles and larger, the facilities must be able to contain peak runoff from a 50-year storm event with sufficient freeboard and a 100-year storm event without freeboard. The storage capacities of detention basins are designed to detain runoff from the 100-year storm.

Based on the rainfall characteristics of the watershed and future land use in the watershed (i.e., assuming building out the *General Plan*), the Flood Control District calculates peak runoff for the design storm (100-year event for large watersheds). It then estimates the cost of the improvements. Based on the cost estimate, a fee schedule is adopted for the watershed by the Board of Supervisors, with the dollar amount of fees based on the amount of impervious surface created. In this manner, new development is required to bear the cost of the required improvements.

Currently, the Tassajara project area is not within an established drainage area. Consequently, the hydrology of the watershed has not been systematically analyzed by the District, and there are no adopted improvement plans or drainage fees.

1 Freeboard is that part of a structure, channel or levee that is built above the design water surface elevation to assure that design flows can be handled.

County Regulations

In 1989, the County Board of Supervisors adopted a revised drainage ordinance (89-28). This ordinance amended requirements for drainage facilities, easements and setbacks in connection with land development projects approved by the County. The ordinance also contains provisions relating to the acquisition of property to construct off-site subdivision improvements. The following summarizes some key provisions of the ordinance.

914-4.002 Protection of Natural Watercourses

The District may require that a watercourse or portion of the watercourse be protected in its natural state.

914-4.004 Watercourse Capacity and Stability Analysis

Before a protected watercourse may be utilized for discharge of urban runoff, the capacity of the channel and stability of its banks shall be substantiated through hydraulic and geotechnical analysis. Design flow exceeding the channel's capacity shall be conveyed around the protected watercourse (i.e., use of a bypass channel) or shall be detained in an adequate detention basin(s).

914-6.2 Earth and Lined Channels

This article provides standards for allowable velocity by runoff, slope gradient of embankments and related matters.

914-12 Detention Basins

The Flood Control District will only maintain regional basins that have a design capacity of at least 15 acre feet. Smaller basins which serve a development can be approved in certain circumstances, but their use is discouraged. Smaller basins must be maintained by a public maintenance entity, and that entity shall have an adequate revenue source to assure perpetual maintenance.

914-14 Rights-of-Way and Setbacks

This article prescribes structural setbacks from man-made and natural channels. All setbacks are relative to the "top of bank," which is defined as the line formed by the intersection of the topographic surface with an imaginary plane with a 2.5:1 gradient, projected from the toe of the creekbank; or the structural setback can be hydraulically defined using a formula provided in the ordinance.

Previous Investigation

Balance Hydrologics, Inc., was retained by the applicant to evaluate the drainage setting of the site, characterize the existing runoff features of the watershed, and monitor existing water quality. The scope of work included analyzing the runoff characteristics of the watershed, assuming buildout of the project. They also identified potential sites for storm water detention basins. Finally, Balance Hydrologics provided recommendations for treating urban runoff before it is discharged into the creek channels in the study area. (Detailed citation of the reports issued by Balance Hydrologics is presented at the end of this section.)

Early in their investigation, Balance Hydrologics, Inc., met with representatives of the Flood Control District. Under contract with the applicant, the District calculated existing runoff in the watersheds which drain the Tassajara project area (Tassajara Creek and East Branch of Alamo Creek). Subsequently, Balance Hydrologics calculated peak runoff (assuming buildout of the project) for each watershed and identified segments of Tassajara Creek and the East Branch of Alamo Creek which were inadequate/marginally adequate to contain peak runoff from the 100-year event. They also identified potential basin sites which could mitigate the hydrologic impacts and made calculations to estimate the storage capacity requirements for the various basin scenarios. During their research, Balance Hydrologics met with the Flood Control District to present a status report of their research and to solicit informal comments and recommendations from District staff.

Hydrologic Method

The District uses a computerized hydrologic model to calculate peak runoff events. The rainfall intensity data used in the model was developed from 60 years of local precipitation records. For large watersheds, the District uses the Hydrograph method to determine peak flow and volume of runoff for a particular storm. The watershed is divided into subwatersheds for analysis. Each subwatershed is used as a building block to obtain the total flow of selected points in the watershed. Each area is then added to those above it to obtain the cumulative flow in the creek at 15-minute intervals throughout the duration of the storm. The addition process is somewhat complex since the flows must be added together, considering the timing of the runoff. Other factors affect the process, so a simple sum will not give the most accurate results. Factors considered by the program in determining runoff, including infiltration rates and roughness factor, are described below:

- *Infiltration Rate.* As the watershed develops, the ground is covered with structures, resulting in less precipitation entering the ground and more surface runoff. This is accounted for by using an "infiltration rate" factor which is the amount of rainwater that will enter the ground during each hour of rainfall. As watershed development proceeds, the rate of infiltration decreases. For purposes of analysis, the District assigned infiltration factors to the subwatersheds based on several parameters, including topography, vegetation, soil conditions and land use information.

- *Roughness Factor.* As a watershed develops, usually there are improvements in the drainage systems as a part of the development process. This change in the drainage systems will permit the flows to run off sooner than would be the case in the unchanged (i.e., current) condition. The model accounts for this change of a roughness factor "n."

As in the case of infiltration rates, the District assigns roughness factors based on the assumed future land use. Using their hydrologic method, the District can calculate estimated peak flows for a storm with a 100-year recurrence interval (the design storm). Subsequently, improvement alternatives can be evaluated that would convey peak runoff from the design storm through the watershed without causing overbank flooding. A point that should be emphasized is that the District's hydrologic method, while based on a procedure developed by the Corps of Engineers, is unique to the District. Balance Hydrologics simulated peak flows using the HEC-1 model, which is used by Alameda County Zone 7 Flood Control. It is also used by FEMA for floodplain evaluation. In summary, Balance Hydrologics used the HEC-1 model which is similar, but not identical to the Contra Costa County Model (CCCM). There is no method that can be used to correlate directly between the two models, which is a complicating factor in analyzing the existing data.

Hydrologic models are only an indicator of the behavior of runoff in a watershed. The actual volume of runoff and peak flow can be expected to vary from calculated values. There are accepted methodologies for selecting values for the parameters that are used in the calculations. For the ultimate design of regional drainage facilities, the hydrologic calculations will be done by District staff, using the District's model. The calculations of Balance Hydrologics are intended to provide a preliminary assessment of the runoff characteristics of the watershed. Those calculations have been critically evaluated by the EIR consultant, and some independent runoff computations have been made by the EIR consultant as a check on the flows calculated by Balance Hydrologics. This critical review resulted in calculations which were within one percent of those developed by Balance Hydrologics for the 100-year event.

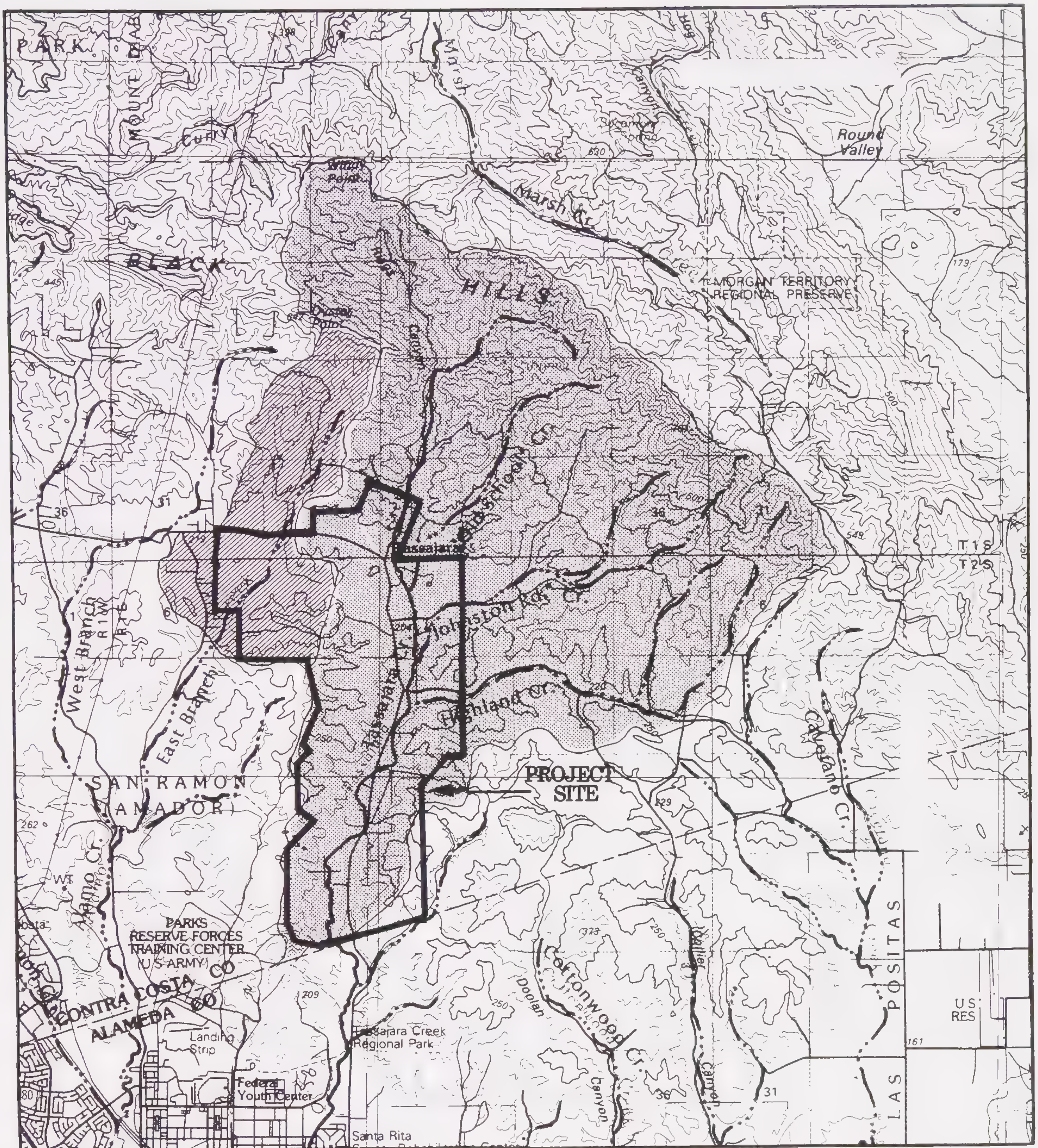
SETTING

Climate

The Tassajara area has a Mediterranean climate with warm, dry summers and mild, wet winters. Average rainfall in the project area is approximately 17.5 inches per year, but seasonal totals range up to 21.0 inches per year in the upper watershed area. Rainfall occurs primarily between October and May.

Drainage

The Tassajara project area is comprised of about 4,500 acres, and is drained by Tassajara Creek and the East Branch of Alamo Creek (hereafter referred to as the East Branch). Figure 4.3-1 shows the location of the watersheds of these creeks as well as major drainages of the region in relation to the planning areas. Figure 4.3-2 shows local drainages in the planning area. Only the main stem of



East Branch of Alamo Creek: Upper Watershed Area (includes runoff area of TVPOA project and lands higher in watershed).

Tassajara Creek: Upper Watershed Area (includes runoff area of TVPOA project and lands higher in watershed).

N

Source: Darwin Myers Associates

Scale: 1" = 1.5 miles

FIGURE 4.3-1 WATERSHED MAP

Tassajara Creek is classified as a perennial stream. Its major tributaries, including Riggs Canyon Creek, Highland Creek and the unnamed channel that drains the Johnston Road watershed, are intermittent streams. The East Branch, along with its tributaries, are ephemeral streams.

Tassajara Creek drainage has been modified in the planning area and upper watershed by rural residential uses, agriculture, grazing and fire control. The East Branch of Alamo Creek has been effected by the Blackhawk and Shadow Creek developments, which include channel improvements in Shadow Creek and a detention basin in Blackhawk. Most of the planning area consists of moderate to steep hills that have been used for cattle grazing. The channels of Tassajara Creek and the East Branch are on the floor of narrow upland valleys. Local areas on the valley floor have been used for walnut orchards. However, the chief agricultural use of the valley floors has been dryland farming of small grains. Both streams are entrenched in alluvium on the valley floors. The highest creek banks occur on Tassajara Creek, near the Alameda/Contra Costa County line, where the bank is approximately 40 feet high. Specific comments on the watersheds and creek channels are presented below.

Tassajara Creek

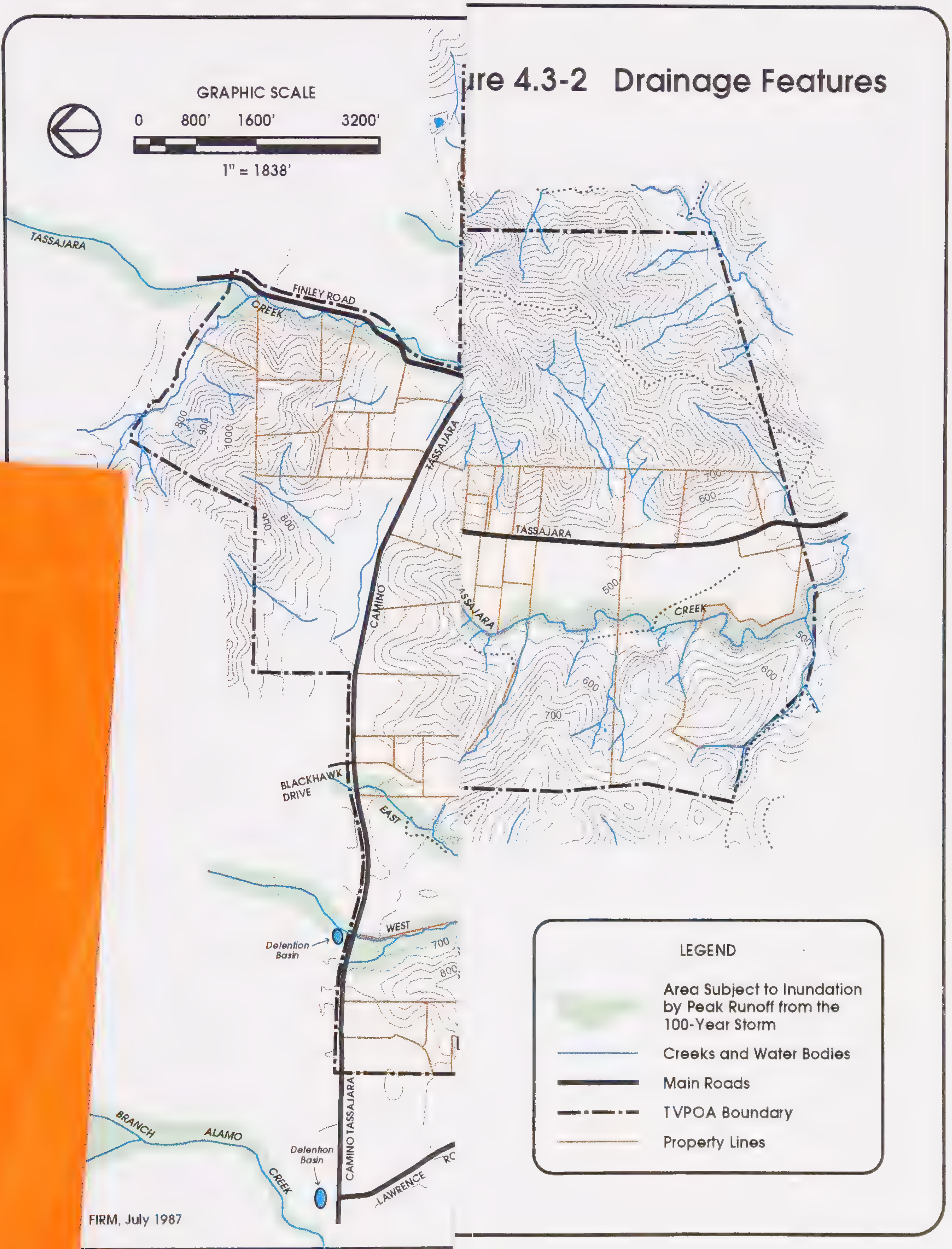
The portion of the Tassajara Creek watershed above the Alameda/Contra Costa County line encompasses about 23.31 square miles. Approximately 1,550 acres of this watershed area is proposed to be converted to an urban land use as part of the proposed project. As Figure 4.3-1 indicates, the project is located in the lower (southwestern) portion of the watershed. Nearly all of the upstream watershed is steep and rocky, with thin soils. Primary use in the upper watershed is wildlife habitat and grazing. Sizable acreage is contained within state and regional parks. The only residential uses in the upstream area are large lot rural residences in the Finley Road/Old School Road area (approximately 40 residences), along with ranch houses on acreage in the Johnston Road and Highland Road areas.

The headwaters of the Tassajara Creek watershed start at an elevation of 1,965 feet mean sea level (MSL), and drop rapidly over an 11 mile stretch to the County line, at elevation 430 feet MSL. Downstream from the project, in Alameda County, the creek is unimproved to I-580. South of the freeway the creek is channelized, and this improved segment joins Arroyo Mocho. Runoff is conveyed to Arroyo de las Lagunas near I-680, where it then flows south to Alameda Creek, turning west through Niles Canyon and discharging into South San Francisco Bay.

East Branch of Alamo Creek

The watershed of the East Branch, upstream from the southwest boundary of the TVPOA, drains an area of approximately 3.58 square miles. Approximately 470 acres of this area is proposed to be converted to an urban use as a part of the project. The upstream watershed includes a portion of the Shadow Creek subdivision along with the easternmost portion of the Blackhawk development (approximately 0.6 square miles of urban land use). The remainder of the upstream watershed is open space lands used for grazing. Downstream from the project is a portion of the Lawrence Road area of Danville. Farther downstream is the Dougherty Valley project site, a proposed development of 11,000

ure 4.3-2 Drainage Features



units on 6,000 acres. Historically, Dougherty Valley has been used for grazing, but with development of the site, regional detention basins are proposed on the West Branch of Alamo Creek and on other tributary streams in that project.

It should be recognized that the location of basins, the acreage required and design details have not been finalized. Figure 4.3-3 shows the sites being reserved for possible use as detention basins in the Dougherty Valley project. Relatively large basins are currently proposed on Coyote Creek, on the West Branch of Alamo Creek, and on the creek which drains the Hidden Valley area. Smaller basins are being evaluated on tributaries of the East Branch. However, no sites are presently being evaluated in Dougherty Valley on either the main channel of the East Branch or on Alamo Creek below the confluence of the East and West Branches.

Below the confluence of the East Branch and West Branch the creek is referred to as Alamo Creek, and for a short distance it is an unimproved channel. However, north of the Alameda County line the channel was realigned to accommodate a residential project in the City of San Ramon. The improved, trapezoidal-shaped channel within San Ramon continues through Alameda County. The improved channel has a capacity to accommodate a 100-year peak flow of 4,670 cubic feet/second (cfs) (see 1992 Dougherty Valley DEIR, p. 10-4). Farther downstream, Alamo Creek has been channelized into what is known as the Alamo Canal. Near the I-680 undercrossing, this canal joins Arroyo del Valle and downstream from this confluence the channel is called Arroyo de las Lagunas. Farther south, it flows into Alameda Creek and ultimately runoff is discharged into South San Francisco Bay.

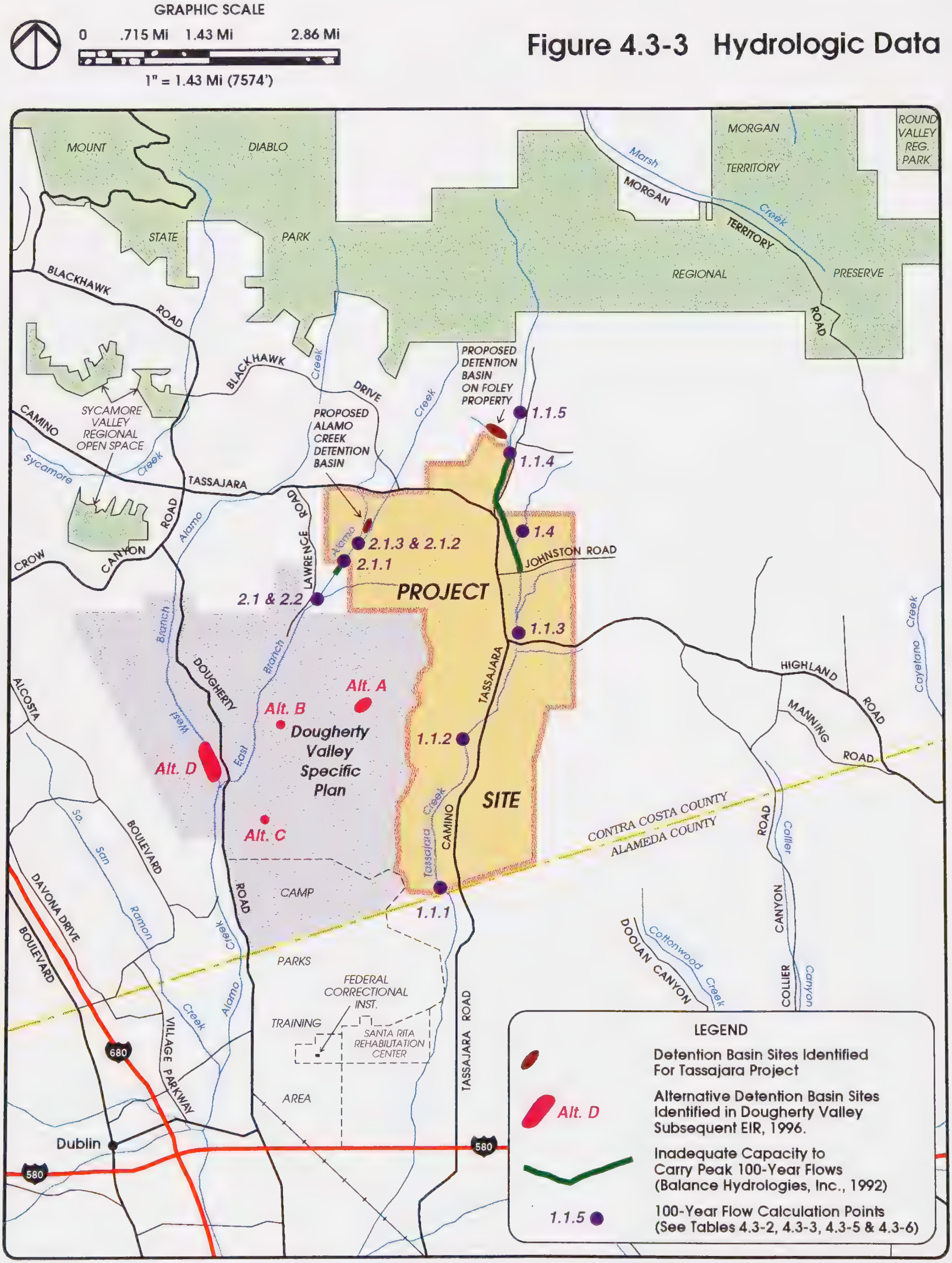
Creek Hydrology - Pre-Development Flows

Tassajara Creek

Since Tassajara Creek drains into Alameda County and into Alameda Creek, Zone 7 of the Alameda County Flood Control District has set criteria for what must be done to protect the downstream drainage facilities. The agency has stated that post-development storm runoff at the County line will be acceptable, provided the peak storm flows do not increase over the existing condition, which has been calculated to be 4,870 cfs for the 100-year runoff event.

As part of the evaluation of flooding conditions on Tassajara Creek, Balance Hydrologics simulated expected water surface profiles for the 100-year event, using the HEC-2 model. The results of the analysis indicated that the water surface is well below the top-of-bank in the central and southern portions of the project site. However, overflow of the existing channel was predicted in the reach of the channel upstream from the Johnston Road bridge with about 300 cfs likely to leave the channel at this location. Under existing conditions, 100-year flood flows go over bank at various locations within a 1.4 mile reach of channel between the north boundary of the project site on Finley Road and the Johnston Road bridge. Over most of this reach, the existing 100-year storm flows are estimated to be 2,270 cfs, but channel capacity typically ranges between 1,400 and 2,000 cfs; and at one point it is 1,000 cfs. Nearly all of the flood prone area is in the Finley Road neighborhood and is an existing problem.

Figure 4.3-3 Hydrologic Data



SOURCE: DARWIN MYERS ASSOCIATES

East Branch

The County Flood Control District calculated peak flows for the East Branch under existing conditions. The East Branch has two culverted crossings of Camino Tassajara. The westernmost tributary (West Fork) drains the Shadow Creek subdivision; and the easternmost tributary (East Fork) crosses Camino Tassajara approximately 2,000 feet farther east, near the east entrance to the Blackhawk Ranch development. The hydrology study indicates that for the 100-year event these channels will carry 495 and 430 cfs, respectively, where they enter the project planning area. The County computed peak flows just downstream from the point where all runoff from the planning area has entered the main channel of the East Branch. At that point, the existing 100-year storm flows are 1,420 cfs.

Ambient Water Quality Conditions

The applicant authorized Balance Hydrologics to perform water quality testing to provide baseline information on pre-development water quality in the Tassajara and East Branch Creeks. The results of this study provides a context for the RWQCB and County Public Works Department to prescribe criteria and approaches for water quality of storm runoff. The data on existing water quality in the creeks may influence selection of Best Management Practices (BMPs) aimed at protection of habitat values and beneficial uses for creeks and wetlands. Moreover, if treated effluent is used for irrigation of the golf course, parks and/or medians, the baseline water quality survey provides a basis of prescribing receiving water standards for Tassajara and East Branch Creeks.

Storm water runoff was sampled during most mid- and late-season storms of the 1992-93 winter rainy season. The Balance Hydrologics report (1993) provides an explanation of the protocols followed during sampling; and all testing was performed by a state certified laboratory. The water quality samples were collected at the following stations:

- Tassajara Creek at the I-580 bridge
- Tassajara Creek near Finley Road/Old School Road intersection
- Alamo Creek near the southern terminus of Lawrence Road
- "Old School Creek," a tributary of Tassajara Creek, near Bruce Drive

Table 4.3-1 compares concentration of key chemical constituents with formal water quality standards of the California Department of Health Services (DOHS). Briefly summarized, arsenic values are substantially below thresholds for acute or chronic effects on freshwater biota. Barium, cadmium and chromium values were well within acceptable limits for drinking water. Selenium, silver, lead and mercury levels were below the limits of detection. Similarly, concentrations of sodium, boron and sulfate fall within the prescribed standards for drinking water.

Ammonia-N and Nitrate-N values fall within the range common for nearby streams. Both Tassajara and East Branch Creeks had nitrate-N levels that are within the allowable range for drinking water. East Branch nitrate-N levels are relatively higher than Tassajara Creek. The result hints at runoff from fertilized lawns in Shadow Creek and Blackhawk as a likely source for the nitrate nitrogen.

TABLE 4.3-1
SUMMARY OF 1993 STORM RUNOFF SAMPLING
AND COMPARISON WITH WATER QUALITY OBJECTIVES AND STANDARDS

Constituent	TVPOA Averages[1]	DOHS Drinking Water Standards[2]	Aquatic Acute Toxicity[3]
pH	7.25	6.5-8.5	--
Specific Conductance (μmhos)	687	900,160	--
Total Suspended Solids (mg/l)	360	none	--
Ammonia - N (mg/l)[5]	0.15	30	--
Arsenic (mg/l)	<0.005	0.05	0.19
Barium (mg/l)	0.29	1.0	--
Cadmium (mg/l)	<0.005	0.005	0.0115
Chromium (mg/l)	0.03	0.1	Cr(3+)3.80 Cr(6+)0.016
Lead (mg/l)	<0.05	0.05	0.275
Mercury (mg/l)	<0.005	0.002	0.0024
Nitrate - N (mg/l)	1.12	10.0	[6]
Orthophosphate (mg/l)	0.21	none	[6]
Selenium (mg/l)	<0.005	0.010	0.020
Silver (mg/l)	<0.01	0.1000	0.0210
Sodium (mg/l)	40	[4]	n/a
Sulfate (mg/l)	74	250,500	none

1. TVPOA data are the average of four stations from storm runoff sampling conducted during 1993 by Balance Hydrologics.
2. EPA drinking water standards and health advisory table, August 1991 (max. contaminant levels): 2 values represent recommended and "mandatory" values.
3. California water quality control plan - San Francisco Bay Basin, 1991 (used hardness of 260 mg/l as $CaCO^3$ in calculating value).
4. At elevated concentrations or proportions, these constituents constrain plant or crop growth; no primary drinking water standards have been set.
5. Un-ionized ammonia concentrations exceeding 0.025 mg/l can be toxic.
6. Biostimulating constituents.

Source: Balance Hydrologics, 1995.

In summary, current stormwater from the study area is generally of good quality for the constituents measured. During low flows there could be some problems relative to specific constituents. For example, ground water in the general area tends to have elevated boron concentrations. When stream flows are low and fed chiefly by springs, boron concentrations could be elevated.

General Plan Goals and Policies

General Plan goals and policies for flood hazards and drainage deal with development on a project-by-project-basis. Specifically, the Flood Insurance Rate Maps are used as a "red flag" to identify properties which may be susceptible to inundation by the 100-year flood. Hydrologic and hydraulic studies are required to further evaluate the hazard. For land development projects, there are five stages where increasing detailed analysis is or can be required. These stages are listed below:

- GPA/*Preliminary Development Plan* Application
- *Final Development Plan*/Tentative Map Submittal
- Condition(s) of Approval of Tentative Map
- Grading Permit Application
- Building Permit Application

The County planning staff has determined that the reports of Balance Hydrologics are adequate for the processing of the GPA/Preliminary Development Plan application. Drainage related *General Plan* goals and policies relevant to the project are presented below.

Policies

Public Facilities/Service Element

7-38 Watershed management plans shall be developed which encourage the development of detention basins and erosion control structures in watershed areas to reduce peak stormwater flows, as well as to provide wildlife habitat enhancement.

7-40 Alternative drainage system improvements such as floodplains, leveed floodways, bypass channels and culverts, and detention basins, shall be incorporated into new flood control plans and existing plans as they are revised.

7-45 On-site water control shall be required of major new developments so that no significant increase in peak flows occurs compared to the site's pre-development condition, unless the Planning Agency determines that off-site measures can be employed which are equally effective in preventing adverse downstream impacts expected from the development, or the project is implementing an adopted drainage plan.

7-48 Open bypass channels, detention basins and all drainage facility rights-of-way which are provided at different locations in order to supplement existing natural creeks should be developed as an asset to the development, e.g., as a secondary recreation use.

7-49 Natural streams and channels which have been structurally modified shall be evaluated for potential use as urban open spaces, linear parks and trails. Cities and other agencies responsible for recreation shall be encouraged to undertake this evaluation.

Conservation Element

8-82 Riparian habitat shall be protected by providing for channel cross-sections adequate to carry 100-year flows, as per policies contained in the Public Facilities/Services Element. If it is not possible to provide a channel cross-section sufficient to carry the 100-year flow, then detention basins should be developed.

8-85 Natural watercourses shall be integrated into new development in such a way that they are accessible and provide a positive visual element.

8-87 On-site water control shall be required of major new developments so that no increase in peak flows occurs relative to the site's pre-development condition, unless the Planning Agency determines that off-site measures can be employed which are equally effective in preventing adverse downstream impacts.

8-91 Grading, filling and construction activity near watercourses shall be conducted in such a manner as to minimize impacts from increased runoff, erosion, sedimentation, biochemical degradation or thermal pollution.

Safety Element

10-34 In mainland areas affected by creeks, development within the 100-year floodplain shall be limited until a flood management plan can be adopted, which may include regional and local facilities if needed. Riparian habitat shall be protected by providing a cross-section of channel suitable to carry the 100-year flow. Flood management shall be accomplished within the guidelines contained in the Open Space/Conservation Element.

<u>Goals</u>

7-Q To employ alternative drainage systems improvements which rely on increased retention capacity to lessen or eliminate the need for structural modifications to watercourses, whenever economically possible.

7-R To enhance opportunities for public accessibility and recreational use of creeks, streams, drainage channels and other drainage system improvements.

Conservation Element

8-U To maintain the ecology and hydrology of creeks and streams and provide an amenity to the public, while at the same time preventing flooding, erosion and danger to life and property.

8-V To preserve and restore remaining natural waterways in the County which have been identified as important and irreplaceable natural resources.

8-W To employ alternative drainage system improvements which rely on increased retention capacity to lessen or eliminate the need for structural modifications to watercourses, whenever economically possible.

8-X To enhance opportunities for public accessibility and recreational use of creeks, streams, drainage channels and other drainage system improvements.

Safety Element

10-G To ensure public safety by directing development away from areas which may pose a risk to life from flooding, and to mitigate flood risks to property.

PROJECT PLANS

The proposed project involves approximately 1,500 acres of residential land use and another 700 acres of irrigated open space and parks, mixed use and public facilities. A basic component of the project includes retaining the channels of Tassajara Creek and the East Branch of Alamo Creek, along with many of their tributaries. Furthermore, the preliminary development plan has been designed to adhere to the channel setback requirements prescribed by the County Ordinance Code (see pg. 4.3-2). Consequently, the major creek channels are to be preserved, with minimal need for creek bank stabilization. The only project elements that would encroach on the Tassajara Creek channel are as follows:

- Control structure for an off-channel detention basin.
- Bridge crossing for Highland Road, Johnston Road, Camino Tassajara, and the one internal road in the project.
- Outfall points for concentrated runoff from developed and undeveloped lands in the proposed project.

- Provision of pedestrian access.
- Stabilization of eroding creek banks, as required.

With regard to the East Branch of Alamo Creek, an off-channel detention basin and outfall points for concentrated runoff is proposed. The only proposed bridge crossing is related to the widening of Camino Tassajara to six lanes, and the crossing of a frontage road that trends subparallel to and is 400 to 700 feet south of Camino Tassajara.

Issues of Concern

Jurisdictional

Mr. Charles van Katwyck, Zone 7, Alameda County Flood Control District, has informally indicated that peak flows after construction of the proposed project should not be greater than existing flows at the County line for the 100-year storm. Using its hydrology method, the County Flood Control District has determined the peak flows on Tassajara Creek at the Contra Costa County line to be 4,870 cfs for the 100-year event.

With regard to Alamo Creek, Zone 7, Alameda County Flood Control District requires that the 100-year storm not exceed 4,670 cfs at the Alameda/Contra Costa County line (Dougherty Valley DEIR, p. 10-4). For the Dougherty Valley project, the Contra Costa County Flood Control District performed a preliminary hydrologic study to determine the feasibility of using detention basins to reduce flood peaks, assuming buildout of Dougherty Valley. The study found that three regional detention basins in the Alamo Creek watershed would be capable of reducing post-project peak flows below pre-project levels. The District, which participated in the selection of basin sites in Dougherty Valley, estimated that the East Branch basin would require a capacity of 40-acre feet. That hydrologic analysis did not take into account the proposed project. Conceivably the East Branch basin could be sized to accommodate added runoff from the project, or a detention basin could be constructed on the project site.

The peak flows on the East Branch of Alamo Creek have been analyzed by the Flood Control District for the project planning area. For the existing land uses in the watershed, the District has determined that peak flows are 1,420 cfs at a point just downstream from the project site. The proposed project includes detention basins on Tassajara Creek and the East Branch to maintain the 100-year storm peak flows in these channels after project buildout.

Flooding: Contra Costa County

Contra Costa County has been mapped by the Federal Emergency Management Agency (FEMA) as part of the National Flood Insurance Program. A review of the official Flood Insurance Rate Map of the planning area indicates overbank flooding under existing conditions, particularly just upstream from the point where the Johnston Road tributary intersects Tassajara Creek. The methodologies used in

developing these floodplains were designated as "approximate level" by FEMA, implying that the determination was based on limited data and is subject to refinement. Figure 4.3-2 shows the 100-year floodplain within the planning area as currently mapped by FEMA.

Because the approximate-level analysis is not accurate enough for project development planning, a more detailed, independent 100-year floodplain determination for existing conditions was developed by Balance Hydrologics. For this study, field surveying by dk Associates produced a series of accurate topographic profiles across the Tassajara Creek channel. Using the Corps-approved HEC-1 hydrologic model to route the 100-year rainfall runoff through the TVPOA portion of the Tassajara Creek watershed, Balance Hydrologics assessed the capacity of the channel using the HEC-2 model. The results of this study indicate that the segment of the Tassajara Creek channel that is downstream from Johnston Road is adequate to carry peak runoff from the 100-year event. Upstream from this point, areas of inadequate capacity were documented over a 1.4 mile reach of channel to the north boundary of the planning area.

To provide further substantiating data, Balance Hydrologics performed spot field surveys of the channel following a January 1993 storm which yielded 3.57 inches of precipitation at Mt. Diablo junction (near the upper boundary of the watershed) and 1.34 inches in Livermore (near the lower watershed). In the aftermath of this storm, Balance Hydrologics noted high water marks at a culverted creek crossing along the first driveway on Finley Road that is north of Camino Tassajara. They estimate that the channel capacity at this point is approximately 1,100 cfs. From the high water mark, Balance Hydrologics estimates that peak flows were approximately 85 percent of capacity. The 100-year event flows at this point are expected to be approximately 2,270 cfs.

Flooding: Alameda County

A severe flooding problem exists in the lower watersheds of Tassajara and Alamo Creeks, downstream from the project area. The channelized segment of Tassajara Creek above I-580 is adequate to carry the peak flows from the 100-year storm, but the Alamo Canal is incapable of conveying the 100-year event (*Dougherty Valley DEIR*, p. 10-4). The most severe flooding problem exists at the point where Arroyo de las Laguna flows under I-680. Here, the bridge has an inadequate flow capacity and acts as a constriction during episodes of heavy runoff. Downstream reaches of Arroyo de las Lagunas are also inadequate. In Alameda County, developer assessment programs have been established to provide funding to correct flooding problems in the area. Land development projects in Contra Costa County are not required to participate in this program.

Contra Costa Clean Water Program

Contra Costa County and the cities within the County, along with the Flood Control District, joined together in 1991 to create an organization called the "Contra Costa Cities • County • District Stormwater Pollution Program" (hereafter referred to as the DSPP). This program represents the local

response to Environmental Protection Agency's (EPA) National Pollution Discharge Elimination System (NPDES). Federal and state regulations have mandated local jurisdictions to radically reduce or eliminate all pollutants from stormwater, which will enhance water quality in the Bay/Delta estuary.

The Regional Water Quality Control Boards (RWQCB) within the state are responsible for overseeing the program. In 1993, a general NPDES permit was granted by the RWQCB to the DSPP. After the permit was issued, these local agencies began a process of self-monitoring based on effluent limitations as stated in the permit. The general permit issued addresses only construction-related water quality effects at present. Through adherence to Best Management Practices, an applicant can request that their grading project be covered under the general permit issued to the DSPP.

For projects in the unincorporated area, such as the TVPOA, the Grading Division of the Building Inspection Department requires a grading permit, and a part of the permit procedure is submittal of an erosion control plan. During grading, County inspectors monitor field operations to ensure the measures called for in approved plans are installed and are effective. If erosion or sedimentation problems occur, the County has enforcement powers to ensure that corrective work is undertaken.

Ultimately, the NPDES program will address the water quality of urban runoff in developed communities. Because the project site would develop over a period of 15 years or more, the preliminary development plan, and other exhibits provided by the applicant, indicate an intent to anticipate the regulatory standards which are coming. Runoff from open lands would be intercepted and conveyed directly to Tassajara or the East Branch Creeks. Plans call for the runoff from developed portions of the project to be routed through typically small water quality basins and lengthy grassy swales appropriate for water quality control in the project. These drainage features would be designed to improve water quality prior to discharging urban runoff into Tassajara and the East Branch Creeks.

Creek Hydrology - Post-Development Flows

Tassajara Creek

Post-development flows were calculated by Balance Hydrologics using the HEC-1 model. This model was developed by the Corps of Engineers, and is the method accepted by FEMA for agencies/private organizations/individuals seeking amendments to Flood Insurance Rate Maps. Flows were computed for six points on Tassajara Creek. The northernmost point is one mile north of the Finley Road/Camino Tassajara intersection, which is upstream from the project site; the southernmost point is at the County line, and there are four intermediate points. Figure 4.3-3 shows the location of the points with respect to the watershed boundary, and Table 4.3-2 presents a summary of the hydrologic data. Briefly summarized, the data indicate that the project would increase the peak flows on Tassajara Creek by approximately 250 cfs (from 4,870 to 5,120 cfs at the County line). This corresponds to a five percent increase in the peak flow. For the three-hour 100-year storm, the project results in an approximate 24-acre feet increase in the total volume of runoff. This represents a 1.6 percent increase in the volume of runoff from the Contra Costa County portion of the Tassajara Creek watershed.

TABLE 4.3-2
ESTIMATED POST-DEVELOPMENT FLOWS
TASSAJARA CREEK

Concentration Points	Upstream Watershed (acres)	Local Developed Area (acres)	Total Developed Area (acres)	100-Year Flows (cfs)
1.1.5	3,266	0	0	2,270
1.1.4	3,755	41	41	2,285
1.4	5,328	89	323	2,860
1.1.3	9,056	399	822	4,160
1.1.2	13,269	346	1,229	5,110
1.1.1	14,288	321	1,550	5,120

Source: Balance Hydrologics, 1992.

Runoff from the northern portion of the project area could increase 100-year storm flows on the reach of channel upstream of the Johnston Road bridge by approximately two percent over the existing conditions, assuming no detention of runoff. With detention near the north boundary of the project area, flows downstream from the basin would decrease below existing flows.

East Branch of Alamo Creek

Post-development flows were calculated by Balance Hydrologics using the HEC-1 model. Figure 4.3-3 shows the location of points along the channel where flood flows were calculated, and Table 4.3-3 presents the calculations. This table indicates that buildout of the project as proposed, would increase 100-year storm flows to 1,505 cfs, which is an increase of 85 cfs over existing flows. The HEC-2 analysis indicates that the existing reach of creek between the planning area and the planned Dougherty Valley detention basin is marginally inadequate to convey the 100-year event. Specifically, the HEC-2 analysis performed by Balance Hydrologics determined the elevation of the peak water surface elevation for the 100-year storm under existing conditions. That study established that a 600-foot-long reach of channel was marginally adequate to contain peak runoff, from Station 66 to 72. As Figure 4.3-3 indicates, the reach of channel is just downstream from the project area.

The Tassajara project will result in urbanization of approximately 468 acres of the East Branch watershed. One consequence of development is that the total volume of runoff will increase due to impervious surfaces created and installation of an efficient drainage system. For a three-hour storm, the project results in an approximate increase of 5.7-acre feet in total volume of runoff. This represents an increase of 2.2 percent just downstream from the project site.

TABLE 4.3-3
ESTIMATED POST-DEVELOPMENT FLOWS
EAST BRANCH OF ALAMO CREEK

Concentration Points	Upstream Watershed (acres)	Local Developed Area (acres)	Total Developed Area (acres)	100-Year Flows (cfs)
2.1.4	251	175	175	380
2.1.3 & 2.1.2	1,626	18	299	1,125
2.1.1	2,016	119	418	1,340
2.1 & 2.2	2,291	0	468	1,505

Source: Balance Hydrologics, 1992.

Approach to Flood Protection

The primary flooding problem on the project site is inadequacy of the Tassajara Creek channel between the northernmost portion of the planning area and the Johnston Road bridge. Much of this 1.4 mile reach of channel meanders through the existing Finley Road community, as well as the developed lots in the Bruce Drive area. Once flooding occurs, the local topography causes sheetflow on the alluvial plain and ponding of waters in low-lying areas. In the watershed of the East Branch of Alamo Creek, there does not appear to be a flooding problem upstream of the Dougherty Valley project. As a component of planned improvements, detention basins are proposed by the applicant which would enable the natural channel to convey runoff without overbank flooding.[2] Both the Dougherty Valley and TVPOA developers have responsibility to incorporate measures in their projects to keep peak 100-year storm flows at the County line at pre-development (existing) levels.

In response to the Notice of Preparation for the proposed project, the Contra Costa County Flood Control District issued a letter urging a regional response to drainage issues rather than project-by-project mitigation. This approach involves looking at the existing pattern of flooding and runoff effects of proposed development as a whole, and then developing the best solution for the watershed. This approach works best in areas where a drainage area has been established, planned improvements identified, and a fee schedule established. In such areas, a land development project can participate in funding the regional facilities, along with solving on-site drainage problems. If formation of a drainage area is not a viable option, then other alternatives for financing and construction of needed improvements must be found. One option being pursued in the adjacent Dougherty Valley project is

[2] The proposed Tassajara Creek basin will reduce flows of the reach of creek between the basin site and the Johnston Road Bridge, and thereby ameliorate the existing flooding problem in the Finley Road neighborhood. Flooding of this area could not be eliminated without off-site improvements on private properties (e.g., replace undersized culverts for existing private driveways).

construction on basins by the developers in accordance with Flood Control District standards, with maintenance of detention basins provided by the Flood Control District. Funding is provided by a County Service Area.

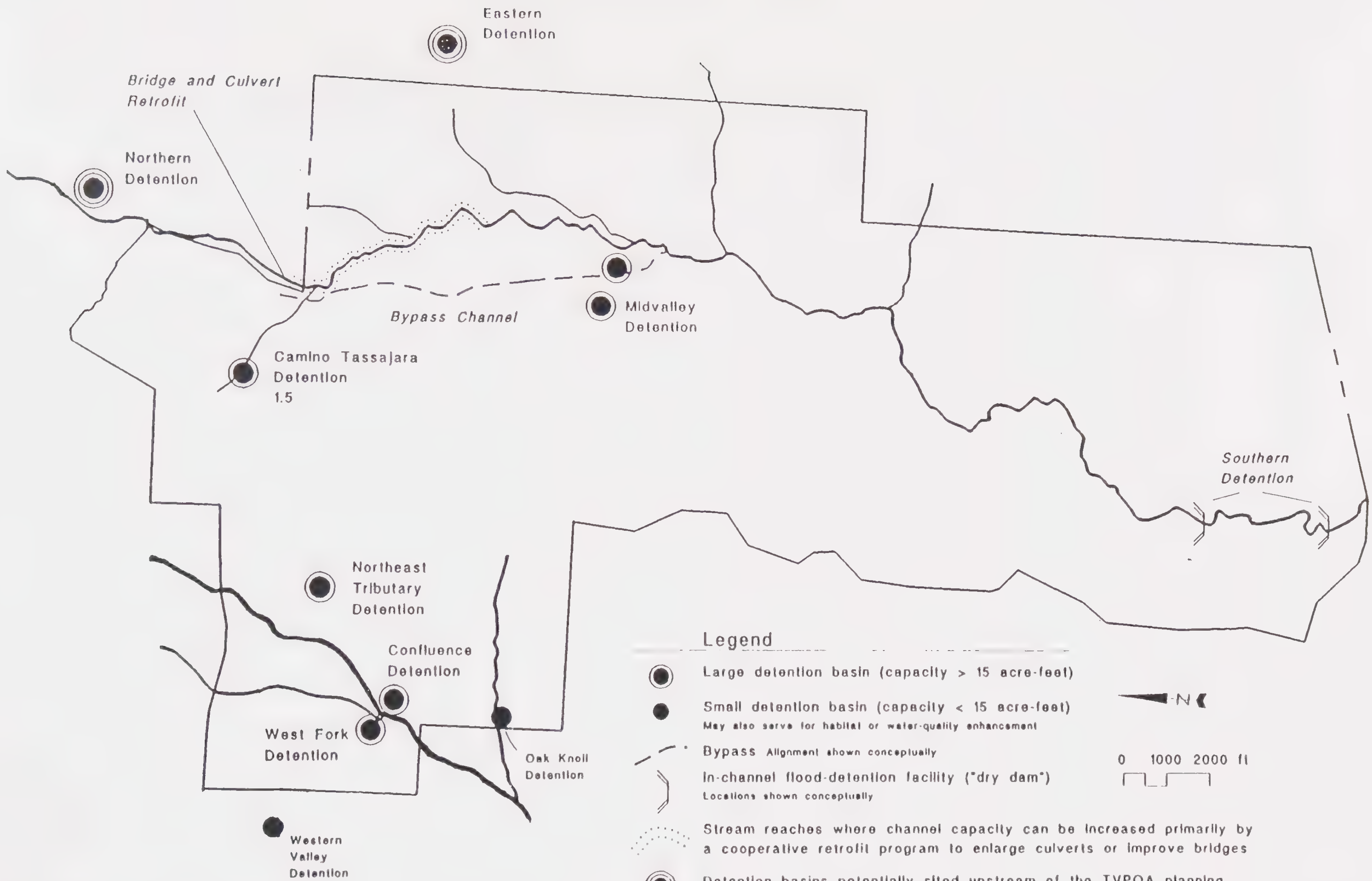
For the proposed project, Balance Hydrologics determined that detention basins would be needed in both the Tassajara and East Branch watersheds to keep 100-year peak flows at existing levels at the County line. They considered six basin alternatives in the Tassajara Creek watershed and five basin alternatives in the East Branch watershed. The alternatives considered fall into three broad categories:

- construct a detention basin on the master stream; or
- construct detention basin(s) on significant tributary stream(s); or
- locate a basin such that most urban runoff could be routed through a detention basin prior to reaching the master stream.

Figure 4.3-4 shows the alternative sites considered by Balance Hydrologics. In the Tassajara Creek watershed, "Northern Detention" was selected by the applicant for the reason that it represented the best regional approach to flood control. The other candidate sites in this watershed were capable of reducing flows at the County line to pre-development levels, but they did not address the flooding problem along the 1.4 mile reach of channel that is north of Johnston Road.

In the Alamo Creek watershed, the alternative proposed by the applicant is a triangular-shaped area at the confluence of two forks of the East Branch. It most closely corresponds to the site labeled "Confluence Detention" in Figure 4.3-4. A basin at this location is just upstream from private properties in the Lawrence Road area of Danville. It would protect the downstream channel from increased peak flows and could be designed as a sediment trap.

Conceivably, the long-term need for this detention basin could be avoided if basins in the Alamo Creek watershed of Dougherty Valley were sized to accommodate the increased runoff generated by approximately 468 acres of development in the TVPOA, and if the intervening channel has adequate capacity to accommodate 100-year storm flows. In the Dougherty Valley project, hydrology of watersheds are being analyzed during the processing of Final Development Plans and potential basin sites are analyzed by basin routing studies. The basins are being designed to be 15-acre-foot capacity (minimum), and the system is being designed to keep post-development peak flows at or below peak flows under existing conditions at the County line. Basins in Dougherty Valley are not being designed to mitigate increased flows resulting from projects higher in the watershed. Windemere Partners have reserved three potential sites for detention basins in the Alamo Creek watershed, and Shapell Industries has reserved one potential site on the West Branch, just above its confluence with the East Branch, along with one basin in the Coyote Creek watershed (total of five basins). The County Flood Control District is currently reviewing the hydrologic data and conceptual basin plans submitted by the developers.



Source: Balance Hydrologics, Inc.

FIGURE 4.3-4 POTENTIAL BASIN SITES EVALUATED

Bridge and Creek Crossings

The project will require several crossings of Tassajara and East Branch creeks. Where required, existing bridges would be replaced to accommodate road widening. Additionally, bridges/culverts would be provided where roads cross wildlife corridors and trails. All proposed culvert, channel and bridge constructions and modifications within the natural watercourse are subject to the County Drainage Permit requirements. The California Department of Fish and Game (CDFG) as well as the U.S. Corps of Engineers will also need to be consulted to determine their specific requirements.

To minimize the impact on the floor and banks of the creek channels, superspan culverts would be utilized. This type of construction minimizes disturbance to channel banks and the floor of the channel. In the aftermath of the construction period, a narrow construction zone translates into a limited erosion hazard. For superspan culverts, the existing floor of the channel can be retained and the zone of disturbance on the creekbank is approximately twice the width of the right-of-way. The disturbance is for equipment access, trail construction and minor grading. The project has responsibilities to accomplish the construction of drainage improvements with a minimum of disturbance and to comply with all applicable permit requirements. The trail plan for the project includes creekside trails along Tassajara Creek. Where bridges span the creek, the applicant proposes a terrace on the slope between the floor of the creek and top-of-bank. Figure 4.3-5 presents a schematic of the applicant's concept. Actual construction details would be prescribed by the County Public Works Department and the California Department of Fish and Game.

Tassajara Creek Detention Basin

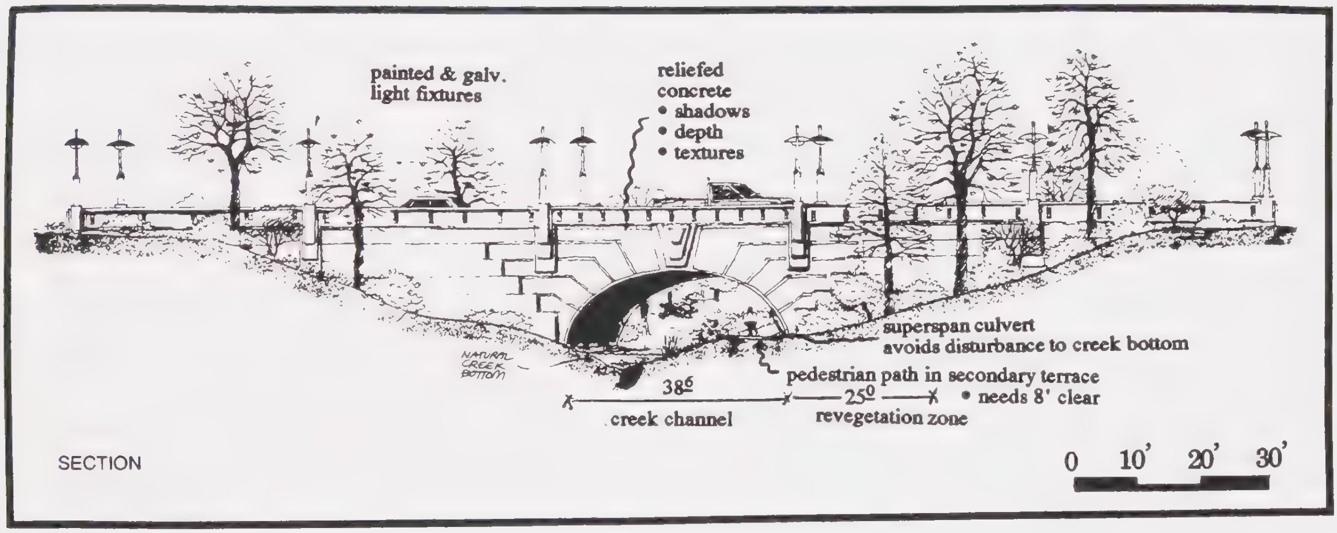
The applicant has identified a potential detention basin site on the west side of Finley Road, immediately north of the planning area, on the Foley property (APN 220-100-02). This site corresponds to the "Northern Detention" identified in Figure 4.3-4. The approximate location of this basin is shown on the Grading Plan (see Figure 4.3-3). The characteristics of the basin are outlined in a report issued by Balance Hydrologics (1992), and amended in a letter dated 5 February 1994 (see Table 4.3-4).

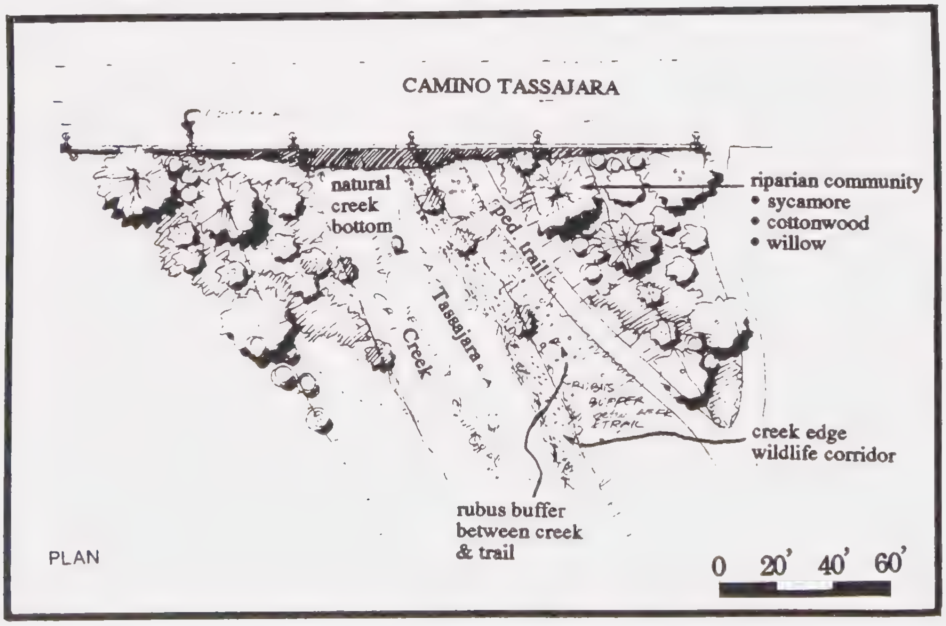
TABLE 4.3-4
SUMMARY OF DETENTION BASIN CHARACTERISTICS

	Flow Decrease (cfs)	Storage Volume (af)	Maximum Depth (feet)	Assumed Area (acres)
Tassajara Creek	250[1]	20	6	5
East Branch	85[2]	12	6	4

[1] Design Criteria: provide a decrease of 250 cfs at County line.
[2] Design Criteria: provide a decrease of 85 cfs where creek exits TVPOA.

Source: Balance Hydrologics (1992).





Source: David Gates & Associates

FIGURE 4.3-5 BRIDGE SCHEMATIC

The proposed site is an upland valley that drains easterly to Tassajara Creek. The applicant's concept is to construct an off-channel basin. Earthwork would be required in the channel of Tassajara Creek which would direct storm flows to the basin; low flows would continue to be carried in the natural channel. The outfall point for the basin into Tassajara Creek would also involve earthwork, including an energy dissipater and erosion control measures.

The precise location of the control structure for the basin and design details are not yet available. Design level drawings would be prepared during future processing of specific land development projects. The basin could be designed so that peak runoff at the County line after buildout of the project would actually be lower than the peak for existing condition. Moreover, a basin at the site proposed would mitigate, but not eliminate, an existing flooding problem within the downstream Finley Road neighborhood.[3] It should be noted that the basin site on the Foley property has not been secured by the TVPOA at this time. It is anticipated that negotiations would be initiated following certification of the EIR and approval of the General Plan Amendment. If this site cannot be secured for some reason, a basin could be located further downstream or on Johnston Creek. (Figure 4.3-4 is a schematic drawing showing the location of potential basin sites.) However, locating the basin further downstream would not afford the protection to existing residents of the Finley Road neighborhood that is associated with the Foley site.

To aid in assessment of the suitability of the Foley property for a detention basin, the applicant has submitted concept plans for alternative uses of the basin. These are schematics, not engineered drawings. It also should be noted that Grading Plans for the Tassajara project, presented in Figures 4.2-8 through 4.2-10 do not indicate when grading for this basin would occur. Construction could be done at one time or it could be phased.

Figure 4.3-6 shows the boundary of the project planning area as a heavy, black, dashed line. In this scenario, the floor of the basin would have a gentle slope from left to right, with embankments having a 4:1 gradient. The approximate location of a weir inlet and outfall structures are indicated. Only during episodes of heavy runoff would the basin hold water, and the time that runoff would be detained would be on the order of 10 to 30 hours. The remainder of the year it would serve as grassland habitat for wildlife.

Figure 4.3-7 shows a scenario for a dual-use basin. In this alternative an athletic field would be constructed in the basin, and the schematic indicates that restrooms and parking areas could be provided. Note that this illustration indicates a drainage channel just south of the basin. This is an existing eroding gully that is entrenched in alluvium on the valley floor. In both scenarios, this drainage channel is to be retained and enhanced with native specie plantings.

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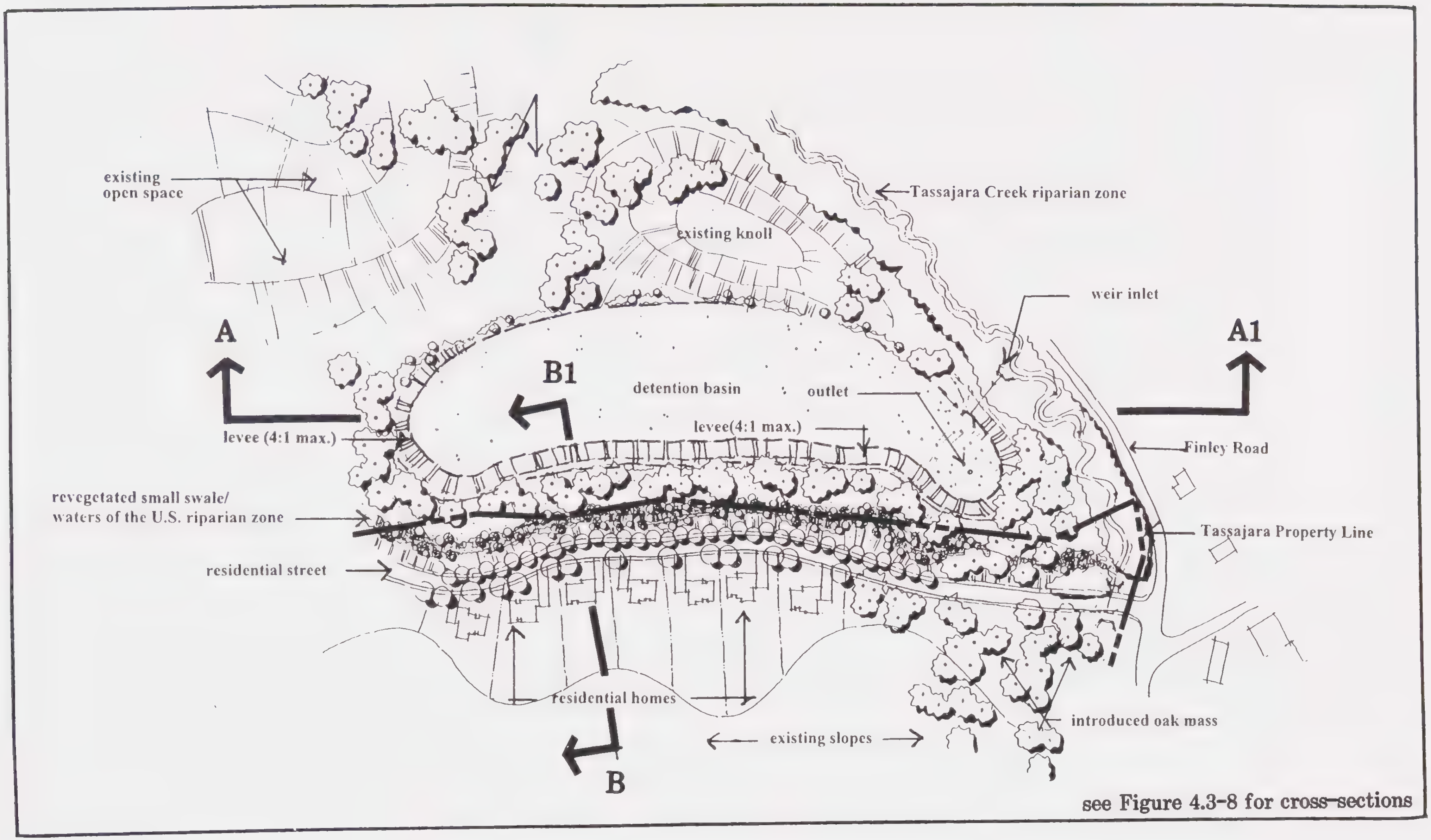
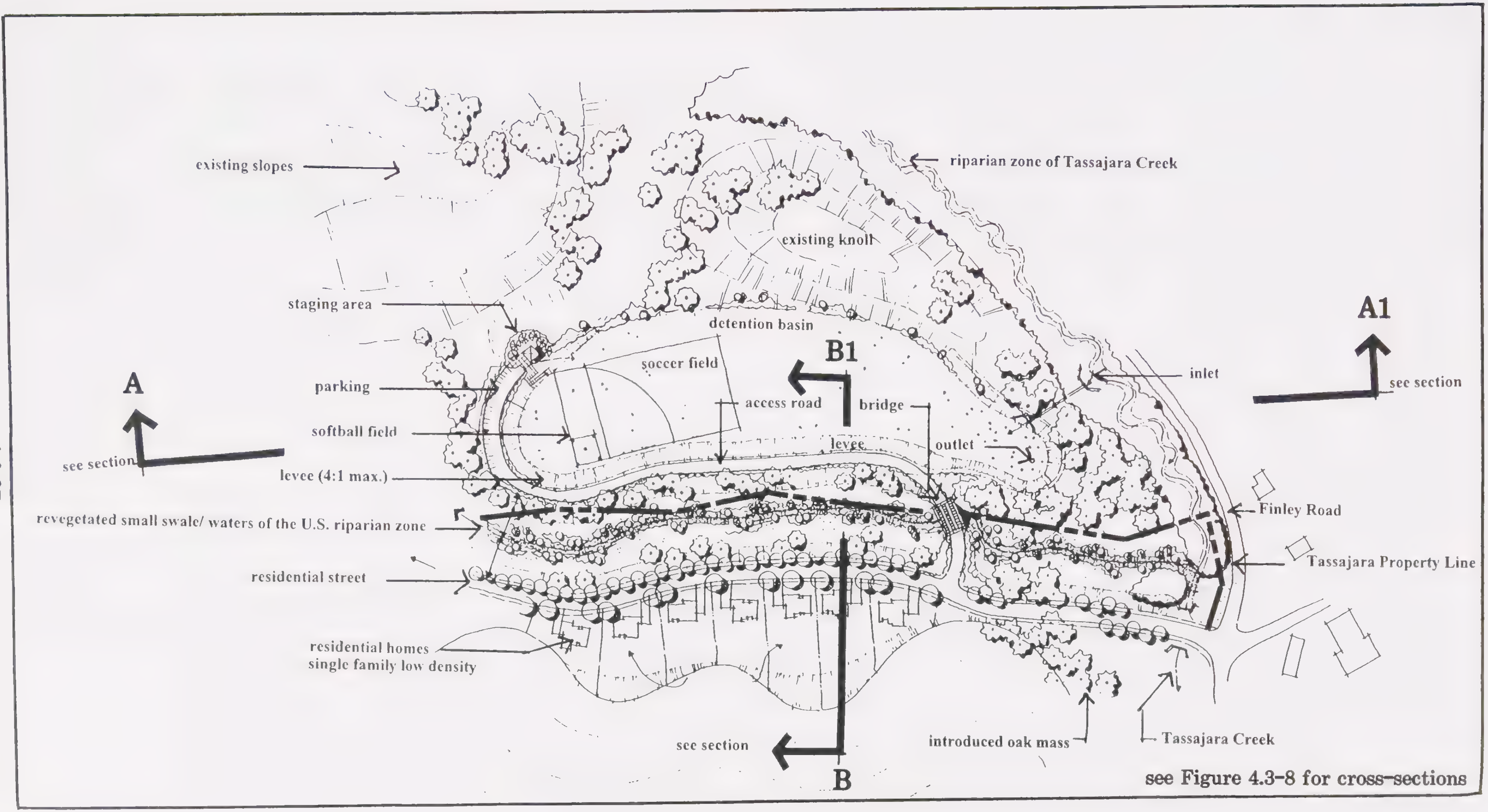
3 The discussion on page 4.3-8, last paragraph, indicates that the reach of channel between the Johnston Road bridge and the basin site has a capacity of 1,400 to 2,000 cfs (and locally as low as 1,000 cfs). The pre-development flows in this reach are estimated to be 2,270 cfs for the 100-year storm event. A basin designed to keep flows at the Alameda-Contra Costa County line at or below the pre-development level will not necessarily be capable of reducing flows exiting the basin to 1,000 cfs or less.



Source: David Gates & Associates

FIGURE 4.3-6 REGIONAL DETENTION BASIN - SINGLE-USE BASIN ALTERNATIVE 1



Source: David Gates & Associates

FIGURE 4.3-7 REGIONAL DETENTION BASIN - DUAL-USE BASIN ALTERNATIVE 2

The information accompanying these schematics indicates that the applicant views the basin as a regional drainage facility to be maintained by the County Flood Control District. Consequently, determinations on hydraulic design criteria for the basin and allowable uses for the property would need to comply with County requirements. The County Flood Control District requires adequate maintenance access, design in accordance with District standards, acceptable provisions for funding maintenance, and fee title to the basin site.

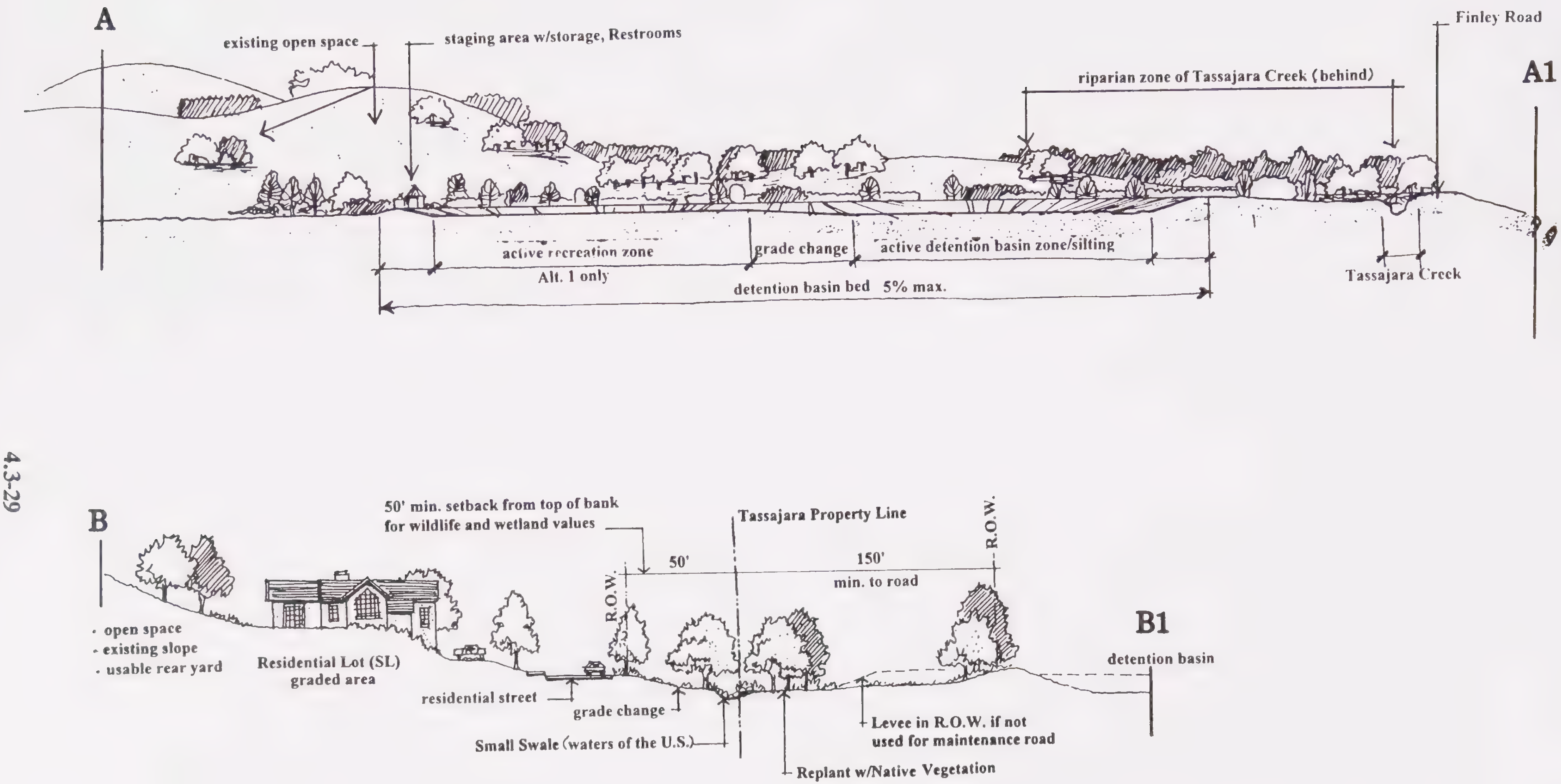
Figure 4.3-8 (upper portion) is a longitudinal (east-west) section through the basin, as shown in Figures 4.3-6 and 4.3-7. If the basin floor was intended solely for flood control purposes, it would have a five percent (maximum) slope to the east. For the dual use scenario, the section shows an elevated athletic field in the eastern half of the basin. The intent of this design would be to prevent inundation of the recreation area by the annual storm. Depending on the design criteria, the area intended for active recreation could be elevated so that it is inundated by the 10-year or 25-year storm, but not by a runoff event with a shorter recurrence interval.

Figure 4.3-8 (lower portion) is a transverse (north-south) section through the basin. The left half of the section is within the project site. This half of the section shows a proposed residence, proposed street, and the existing gully (labeled waters of the U.S.). The right half of the section shows a levee and the adjacent portion of the detention basin. The trees shown, along with the basin right-of-way, are conceptual.

East Branch Detention Basin

The Alamo Creek basin site selected by the applicant is an off-channel, triangular-shaped area just north of the confluence of two forks of the East Branch of Alamo Creek. The preliminary analysis performed by Balance Hydrologics indicates that the basin would need to decrease peak flows downstream from the basin by 85 cfs for the 100-year event (see Table 4.3-4). The conceptual design studies indicate the basin would require storage capacity of 12-acre feet. Assuming the basin was designed for a maximum water depth of six feet, a basin site of approximately four acres would be adequate.

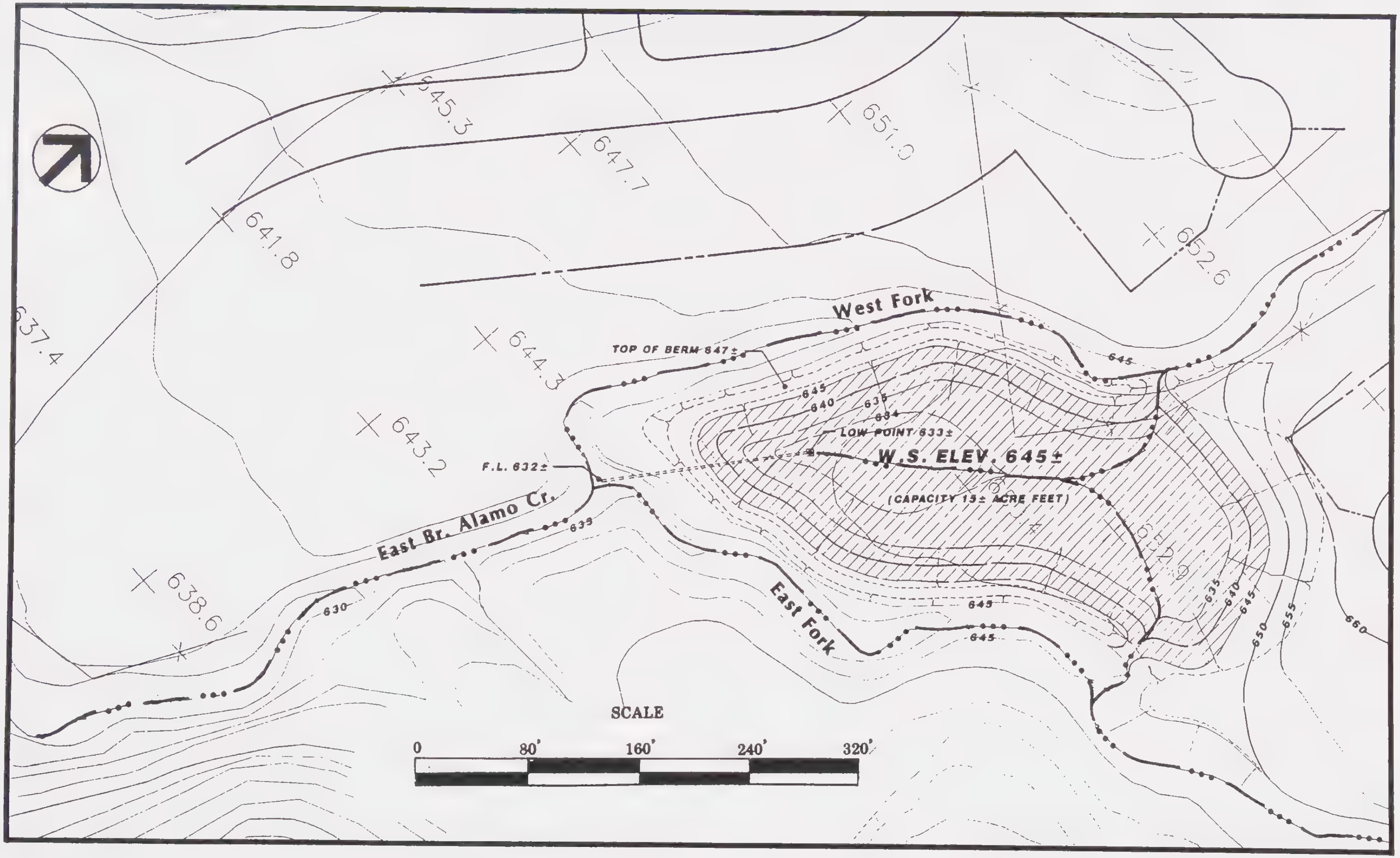
Figure 4.3-9 is a conceptual plan for an off-channel basin that is bounded by the channels of the East Fork and West Fork. In this scenario, the storage capacity is indicated to be 15-acre feet, which is sufficiently large for the basin to be turned over to the County Flood Control District for maintenance. The berm on the perimeter of the basin is 8 feet high (maximum). As shown, the top of the berm is 10 feet wide and the flanks of the berm passes a gradient of 3:1 (horizontal to vertical). The basin occupies a 4-acre site. The plan indicates that the existing channels would be retained. Low flows would continue to be carried by the East and West Forks. However, during substantial runoff events, nearly all runoff carried by the two forks would be directed into the basin. The outfall structure is a culvert that would discharge into the channel of Alamo Creek at the confluence of the two forks. A routing study would be needed for final design of the basin. If additional capacity was required to mitigate drainage impacts, it would be conceivable to extend the basin to the northeast.



Source: David Gates & Associates

see Figures 4.3-6 & 4.3-7 for lines of section

FIGURE 4.3-8 CROSS-SECTIONS OF REGIONAL DETENTION BASIN



Source: dk Associates (1995)

Figure 4.3-9 Alamo Creek Detention Basin Conceptual Plan

In December 1996, the Board of Supervisors approved the Wendt Ranch General Plan Amendment (GP-95-0012) and the associated rezoning (RZ 963037). The site of the regional detention basin on Alamo Creek identified in Figure 4.3-9 is in the southwest corner of that property. The developer of the Wendt Ranch project is currently proposing to construct a detention basin in that same portion of the property. However, the concept shown on plans submitted to the County is for a 5-acre-foot basin that is sized to mitigate only the impacts associated with increases in runoff resulting from buildout of the 323 dwelling unit Wendt Ranch subdivision. If the Flood Control District ultimately approves the concept of a project-specific detention basin, the project would require another site or sites in the Alamo Creek watershed to mitigate its impact on flood flows. Two sites previously analyzed by the project proponent are labeled "Northeast Tributary Detention" and "Oak Knoll Detention" in Figure 4.3-4.

It should also be recognized that the schematic presented in Figure 4.3-9 is not consistent with the guidelines of the Flood Control District. The guidelines call for a top width of embankments (levees) to be 18 feet wide. Side slopes are to be of 4:1 (or flatter) below the design waterline and 3:1 above the design waterline.

Flood Control District Comments

General

The Flood Control District's staff has reviewed the calculations of Balance Hydrologics. This review included evaluation of infiltration rates and roughness factor for the post development condition. The District's comments are presented in a August 7 memorandum prepared by Paul Detjens, Engineer. According to the memorandum, when using the same input parameters, the Contra Costa County Model (CCCM) generally produced results slightly higher or lower than HEC-1. The differences between the two models was attributed to calibration differences. The memo notes that both Tassajara Creek and the East Branch of Alamo Creek are retained as natural channels, with minimal creek bank stabilization. Balance Hydrologics used a "n" value of 0.075 for both the pre-development and post-development calculations. The District points out that if the channel requires even minor improvements, the "n" value could drop from 0.075 to 0.070, which would increase peak flows by roughly double the increase forecasted by Balance Hydrologics. Clearly, it is important that the creek vegetation and hydraulic inefficiencies of the natural channel be retained or additional mitigation measures will be required for both watersheds.

Tables 4.3-5 and 4.3-6 present preliminary post-development flows calculated by the Flood Control District staff. These calculations are provided for two scenarios: (1) no channel improvements, and (2) minor channel improvements. For comparison, these tables also present the post-development flows forecasted by Balance Hydrologics.

Briefly summarized, the Flood Control District's hydrologist considers the post-development flow forecasts of Balance Hydrologics to be generally consistent with the flows calculated using the CCCM. If minor channel improvements are required that drop the "n" value to 0.070, the result would be an increase in peak runoff by approximately 410 cfs in the Tassajara Creek at the County line; and an increase of approximately 120 cfs in the East Branch of Alamo Creek just downstream from the project.

TABLE 4.3-5
ESTIMATED INCREASE IN POST-DEVELOPMENT FLOWS
TASSAJARA CREEK

		100-Year Flow Increase (No Channel Improvements)		100-Year Flow Increase (Minor Channel Improvements)
Concentration Point[1]	Upstream Watershed (ac)	Balance[2] (cfs)	CC County[3] (cfs)	CC County (cfs)
1.1.4	3,755	15	20	100
1.1.4 & 1.5	4,096	50	70	170
1.1.3	9,056	240	190	390
1.1.2	13,269	240	220	450
1.1.1	14,288	250	220	410

1 See Figure 4.3-3 for map showing location of concentration points.
2 Balance Hydrologics, Inc., 1992.
3 Paul Wu memorandum, September 7, 1995.

TABLE 4.3-6
ESTIMATED INCREASE IN POST-DEVELOPMENT FLOWS
EAST BRANCH OF ALAMO CREEK

		100-Year Flow Increase (No Channel Improvements)		100-Year Flow Increase (Minor Channel Improvements)
Concentration Point[1]	Upstream Watershed (ac)	Balance[2] (cfs)	CC County[3] (cfs)	CC County (cfs)
2.1.2	610	20	15	45
2.1.3 & 2.1.2	1,626	25	60	90
2.1.1	2,016	75	--	--
2.2	275	5	5	5
2.1 & 2.2	2,291	85	100	120

1 See Figure 4.3-3 for map showing location of concentration points.
2 Balance Hydrologics, Inc., 1992.
3 Paul Wu memorandum, September 7, 1995.

The types of minor improvement that could trigger a change in the "n" value include stabilizing an eroding creek bank; removing excessive vegetation; reconstruction of a short reach of channel; disturbing the channel banks to construct a culvert or control structures for an off-channel detention basin.

Tassajara Creek

The Flood Control District's staff (Detjens, 1995) considers the Northern Detention Basin option for Tassajara Creek feasible to mitigate the 250 cfs increase in flow predicted by Balance Hydrologics. According to their memo, further hydrologic studies will be required as project plans become more refined, and more accurate land use totals are available. In addition, the basin outflow hydrograph will need to be routed to points downstream to determine the true reduction in flow, and to verify that the developed condition peak flows are less than the existing condition peak flows at the County line. Nevertheless, at this early stage in the planning process, it appears that the "Northern Detention Basin" can be designed to lower the peak flow at the County line to pre-project levels.

East Branch of Alamo Creek

A memorandum issued by the Flood Control District on 4 October 1995 addresses the concept of an off-channel detention basin on the East Branch. A schematic of this basin is presented in Figure 4.3-9. It would be located immediately upstream from the confluence of the East and West Forks of this stream, with a design capacity of 15-acre feet. The District's memo indicates the following concerns with the preliminary design:

- The levee/embankment section between the existing creeks and the excavated storage area may need significant armoring to prevent breech from the surrounding creek channels into the basin.
- Maintenance access to the embankment between the creek and basin is limited by the narrow top width of the levee, and is blocked by the two weir structures and the low flow channels.
- Increase the top width of the levee section and relaxing the basin side slopes to meet District standards would eliminate much of the required storage.
- The design and analysis of the two side flow weirs is needlessly complex. Flow can go two ways through each weir, depending on relative stage of each creek and the basin.

The District's memo goes on to state that these factors could be mitigated if the basin were designed as an on-channel facility. In this scenario the area between the two forks of the East Branch of Alamo Creek could be excavated to provide adequate storage capacity. A small embankment and spillway could be constructed just downstream from the confluence of the East and West Forks. In summary, the location of the basin would not need to be modified significantly. However, the East and West Fork channels would be routed through the basin. This solution implies that the wetland habitat values along the lower reaches of the channels would need to be mitigated within the basin.

With regard to the calculations of Balance Hydrologics, the District indicates that they appear adequate for this stage of the planning process. Further hydrologic studies will be required as project plans become more refined, and more accurate land use totals are available. In addition, the current concept for an East Alamo Creek detention basin would need to be modified to an on-channel basin, and a basin routing study would be required at that time to verify that the facility will be capable of mitigating downstream drainage impacts. It will also be necessary to determine if the basin will mitigate existing deficiencies of the downstream channel. Specifically, there is a 600-foot reach of the East Branch, from Station 66 to Station 72 where the channel banks are approximately 6 feet high and the calculated peak water surface elevation under existing conditions approximately coincides with the top-of-bank. Without these future hydrologic studies it is unclear whether the construction of the "confluence basin" will mitigate the inadequacies of this downstream reach of the East Branch channel.

Water Quality BMPs

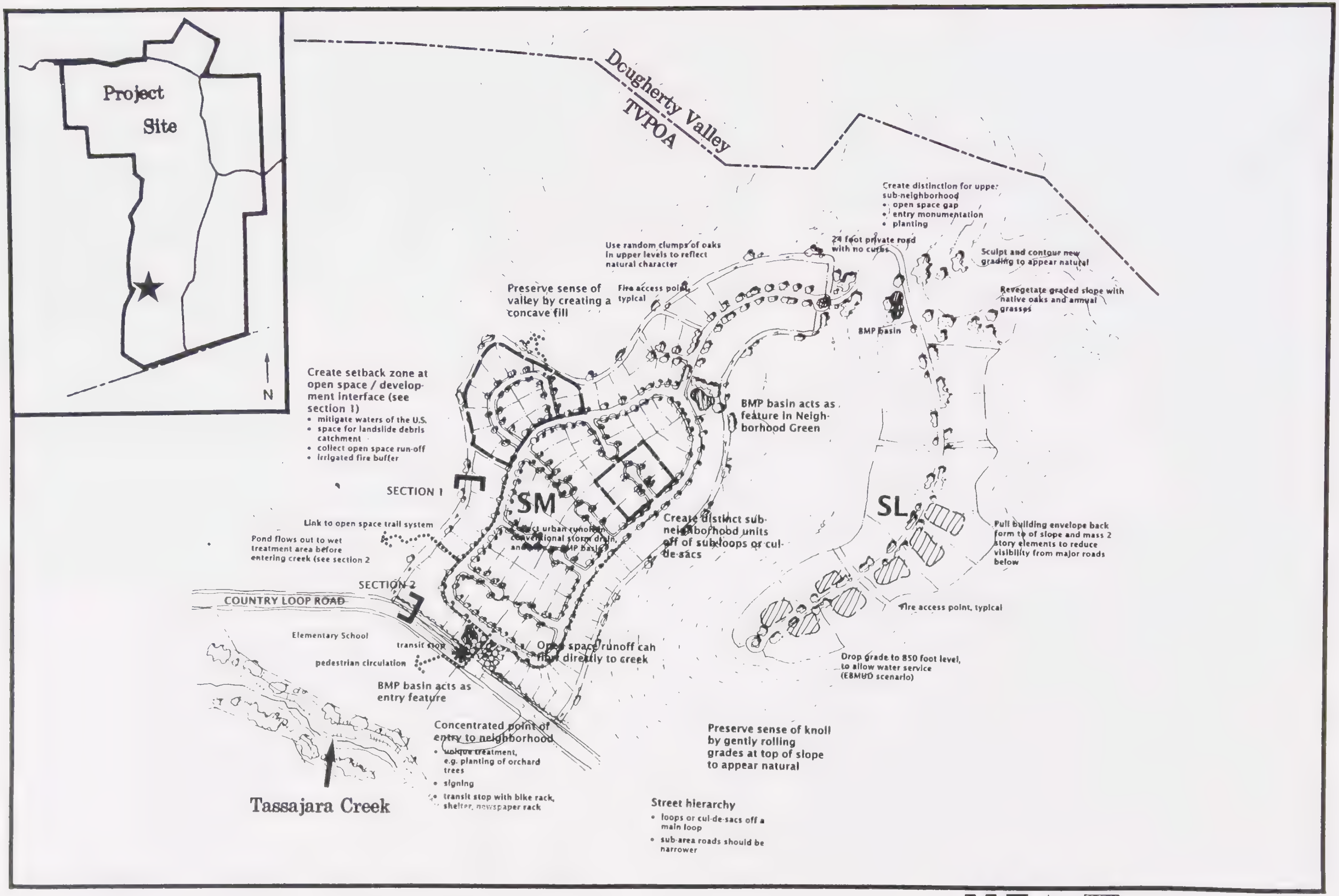
The applicant has provided conceptual Best Management Practices (BMPs) tailored to individual neighborhoods, and integrated with the erosion-control plan. To demonstrate the concept, three neighborhoods were selected as example sites to show the overall approach to control nonpoint-source runoff water quality. The underlying principles to intercept and direct runoff from open space to the channels of Tassajara or East Branch Creeks. Runoff from developed areas is to be directed into water quality basins for treatment before passing into streams.

Figure 4.3-10, Neighborhood A Prototype, shows three BMP water quality basins that are part of an integrated system. The upper basin would receive runoff from the lots highest in elevation (labeled SL); the middle basin would receive runoff from the central portion of the neighborhood, and the basin at the entrance to the project would receive runoff from the lowest portion of the project. Runoff would reach the water quality basins by a conventional storm drainage system and after exiting the neighborhood, runoff would be carried by a grassy swale (i.e., wet treatment area) before being discharged into the creek.

The design and space requirements of the ponds would be guided by the size of the drainage area for each pond and contaminants that are to be trapped. As an annotation on Figure 4.3-10 indicates, basins can be designed to serve as entry features or the focus of a pocket park. The basins shown occupy an area about the size of a residential lot, but the actual size required would depend on the size of the drainage area and anticipated runoff volumes. Conceivably, the basins could be significantly larger.

The water quality basins can be designed to trap sediment, and thus can be effective in removing heavy metals which adhere to clay particles. Swales remove smaller amounts of materials, but can be effective if used in combination with basins. A wet marsh can be effective in removing nutrients; and basins can be engineered to trap floating material (litter, oil, etc.).

A report prepared by Balance Hydrologics (1993) outlines the steps necessary to design an integrated water quality system within a neighborhood. It consists of a two-stage process. The initial task is to examine the topography, size of the local drainage area, and other parameters to characterize anticipated land uses and drainage relationships, assess land area requirements/opportunities for water quality



Source: David Gates & Associates

FIGURE 4.3-10 NEIGHBORHOOD PROTOTYPE A

basins, drainage swales, marshes; and develop a conceptual plan. Normally this would be done concurrently with design of the tentative map. Subsequent to this preliminary analysis, structure design, plans and specifications are required. Normally this would be done as a Condition of Approval of the final subdivision map.

The project proponents intend to treat urban runoff in water quality basins and grassy swales before it is discharged into natural creek channels. These drainage facilities within the project shall be designed to trap silt, grease and litter. Figure 4.3-10 shows three BMP water quality basins within a neighborhood in the proposed project. Figure 4.3-11 presents photographs of a water quality basin of the type proposed, along with a man-made channel to convey runoff to a water quality basin. Figure 4.3-12 presents alternative concepts proposed by the applicant for the design of water quality basins. The upper illustration shows a basin that is designed to filter water through a sand, gravel and geotextile on the floor of the pond. Ultimately, runoff would reach a perforated PVC pipe within the gravel layer, and then be conveyed to a grassy swale. The bottom illustration on Figure 4.3-12 shows a basin designed with an impervious floor. In this scenario the water level would be regulated by a standpipe equipped with a trash rack. Conceivably a red line could be painted on the standpipe to indicate the point when clean out of accumulated sediment is required.

It is anticipated that at least some water quality basins would be designed to hold water year-round. During the processing of land development applications, detailed design drawings would be prepared for basins, a basin management plan would be formulated, and mechanisms to assure perpetual maintenance would be needed at that time.

IMPACTS AND MITIGATION MEASURES

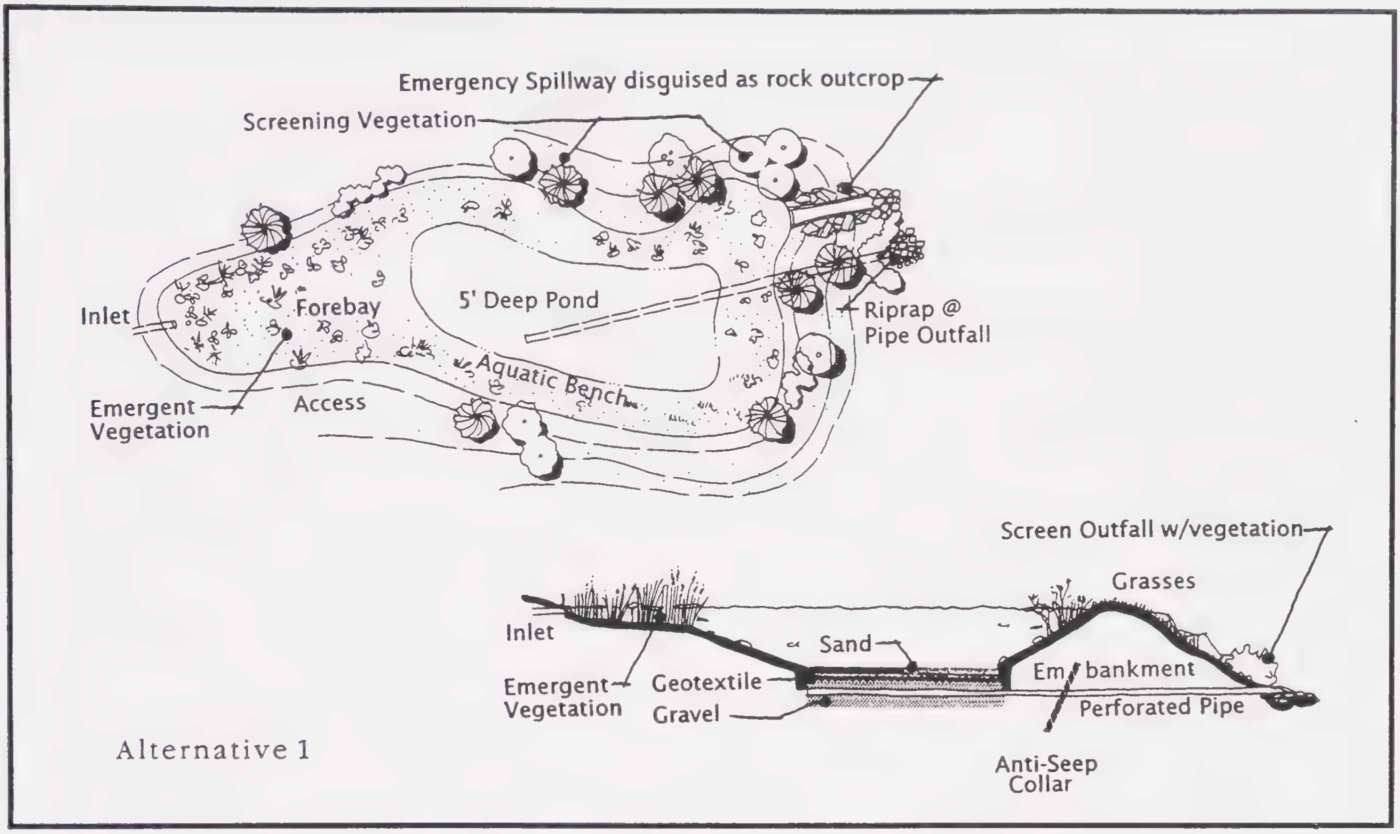
Significance Criteria

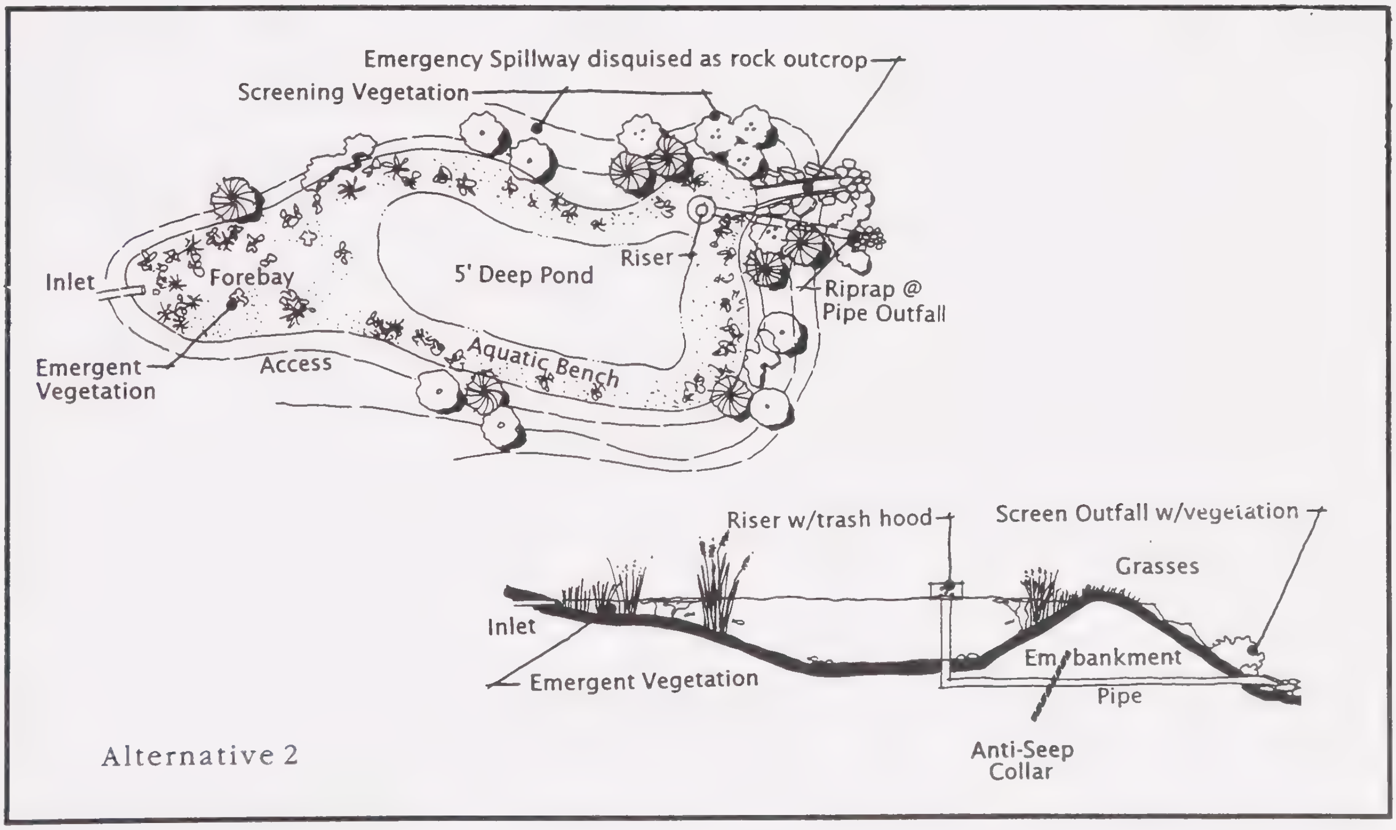
Impacts and mitigation measures related to drainage and hydrology are described in this section. The focus of the analysis is on the impacts within the Tassajara and East Branch Creek watersheds. The California Environmental Quality Act (CEQA) Guidelines Appendix G (1992 revised) indicate that a project will normally have a significant adverse effect on the environment if it will increase the amount of surface runoff (beyond that which can be conveyed in the downstream channels without damage), change the pattern of surface runoff (to the extent that off-site damage occurs from the resulting increase or decrease in flows), or alter water quality (to the extent that beneficial uses are reduced or eliminated).

All impacts are considered significant adverse impacts unless identified otherwise. The corresponding mitigation measure(s), unless otherwise noted, would be sufficient to reduce impacts to a less-than-significant level. Although not required by CEQA, some less-than-significant impacts have been discussed because they are issues of local concern. While no mitigation measures are required by CEQA for less-than-significant impacts, in some cases recommendations are proposed that could be considered by staff as conditions of project approval.

FIGURE 4.3-11 WATER QUALITY BASIN

Source: TVPOA





Source: David Gates & Associates

FIGURE 4.3-12 WATER QUALITY BASIN

Methodology and Key Assumptions

Existing hydrologic analyses were used to assess project-related impacts on the surface water and groundwater resources in the planning area and the region. The project's compliance with existing plans and policies and state and federal regulations was considered when assessing flooding, erosion, and water quality issues and potential impacts. The EIR consultant did perform independent HEC-1 hydrologic analysis for the post-construction condition as a check on the 100-year flows reported by Balance Hydrologics. For Tassajara Creek, Balance Hydrologics calculated a 250 cfs increase in the peak 100-year flows at the County line; the EIR consultant calculated a 280 cfs increase at this concentration point. The key assumption used in evaluation of project impacts are as follows:

- The preliminary post-development hydrologic analyses performed by Balance Hydrologics and the pre-development analysis by Contra Costa County Flood Control District are sufficient to determine potential project impacts.

- The results of the preliminary detention basin feasibility analysis developed by Balance Hydrologics are sufficient to determine potential project impacts and develop mitigation measures. The preliminary analysis indicated that the construction of detention basins on Tassajara and East Branch Creeks will reduce peak flood flows for the 100-year event. The design criteria for each basin should assure that peak flows following buildout of the project should be less than existing peak flows for the 100-year event.

- Zone 7 of the Alameda County Flood Control District requires that post-development flows not exceed existing flows for the 100-year event at the County line. The Contra Costa County Flood Control District has computed existing 100-year flows for Tassajara Creek (4,870 cfs) and Alamo Creek (4,670 cfs).

- The project will be designed to remove land proposed for development out of the FEMA 100-year floodplain, or areas in the floodplain will have pad elevations at least one foot above the elevation of the peak water surface. (Note that the existing Finley Road neighborhood is outside of the proposed Tassajara project area. The planned development does not have responsibility for correcting the existing flooding problem in this reach of the channel.)

Increased Runoff

Impact 4.3-1 The development that is proposed for the project planning area would increase storm runoff in the Tassajara and East Branch watersheds. The result would be increases in peak flows and total volume of runoff that could aggravate the existing flooding problem in Alameda County.

Buildout of the project would result in more paved surfaces. The decrease in pervious area would result in less infiltration of rainfall into the ground, causing peak flows as well as total runoff volumes to increase. Also, improved storm drainage channels tend to speed storm runoff into the streams. This

tends to decrease the response time of the watershed, which results in increases in storm peak flows from the project planning area.

In order to estimate the effect of the development of the planning area on storm runoff in Tassajara and East Branch Creeks, changes were incorporated in the watershed model (i.e., modifying the infiltration factors for the watershed, and modifying the roughness coefficients for the storm drain channels). Because the *Preliminary Development Plan* was subject to amendment during the project approval process, refinements using various rates of infiltration for the various proposed land uses and densities was not attempted. Instead, for the developed area it was assumed that, on average, 53 percent impervious surfaces would be created. The hydrologic model runs indicate a net increase of 250 cfs (five percent increase) over the existing 100-year peak flow of 4,870 cfs on Tassajara Creek and an 85 cfs (six percent increase) on the East Branch near the south property boundary. Because of the severity of the existing flooding problem in Alameda County, and Zone 7 requirements, this impact is considered significant. The increase in total runoff volume for the 100-year storm is also considered significant. Buildout of the project planning area would increase the total volume of runoff on Tassajara Creek by approximately 24-acre feet; and the East Branch would increase by approximately 5.7-acre feet.

Mitigation Measures

All of the following mitigation measures are required to reduce the impact of increased runoff to a less-than-significant level.

4.3-1(a) *The applicant should construct a detention basin on Tassajara Creek to reduce post-development flows to predicted pre-development levels at the County line. The preliminary design of the basin should be based on results of a hydrology model run using the County Flood Control District's model.*

The hydrology analysis should include model runs for a family of storms (e.g., 3 hr., 6 hr., 12 hr., 24 hr., 36 hr.) to ensure that design parameters for the basin represent a worst-case scenario. The analysis should include a basin routing study and calculation of 100-year flows in the downstream channel. Points where 100-year flows should be calculated include: a) within the inadequate reach of channel between the Foley property and the Johnston Road bridge and b) the County line, and at intermediate points as needed.

4.3-1(b) *Additional hydrologic analyses of the type specified above should be performed to confirm that the proposed basin site at the confluence of the east and west forks of the East Branch is capable of maintaining or reducing the existing peak flood flows on Alamo Creek at the County line. This analysis will necessarily need to take into account the effect of proposed downstream detention basins in the Dougherty Valley project.*

The hydrology analysis may also need to consider the scenario where the Dougherty Valley development and the downstream basins do not materialize or are significantly delayed in relation to the construction of Phase 1 of the project.

As noted in the discussion commencing on page 4.3-31, the Flood Control District comments the East Branch detention basin should be constructed as an on-channel basin. Construction of an on-channel basin implies realignment of the lower-most reach of both the East and West Forks of the East Branch Creek. This could involve a possible secondary impact to the biologic resource value of the affected reaches of the channel.

If the detention basin on the Wendt property is designed as a stand-alone, project-specific facility, the project proponent for the TVPOA shall reserve the Northeast Tributary Detention and Oak Knoll Detention sites for possible use as detention basins, subject to future review and approval by the Flood Control District.

4.3-1(c) *Based on the experience of the Contra Costa County Flood Control District, regional basins are more efficient to maintain and are preferable to smaller, project-specific facilities. If project-specific basins are proposed, a mechanism to assure perpetual maintenance is needed. A homeowners association would not be adequate for this purpose.*

4.3-1(d) *Detention basin design should involve coordination with Zone 7, Alameda County Flood Control District prior to final design.*

4.3-1(e) *Each detention basin should be oversized to ensure that the initial accumulation of sediment will not reduce the storage capacity of the basin below that required for the 100-year design storm. This is especially important for East Branch detention, because of its location with respect to development. (Suburban development may be highly sensitive to maintenance activities; over-sizing the basin would reduce the frequency of maintenance, and could allow post-development flows exiting the basin to be reduced below existing peak flows in the downstream channel.)*

Secondary Impact

Oversizing the detention basin would result in a greater loss of grassland habitat.

4.3-1(f) *The Flood Control District would not be adverse to providing maintenance to the proposed Tassajara Creek Detention Basin provided that the following conditions are satisfied:*

- *the basin is designed and constructed conforming to the District's standards and specifications;*

- *an adequate, perpetual, funding mechanism, such as a Benefit Assessment District, is in place to assure perpetual maintenance of the basin facilities; and*

- *any planned dual use of the basin right-of-way is covered by a joint use agreement which should first be reviewed and approved by the Flood Control District.*

Conceivably the District would also be willing to provide maintenance for the East Branch basin provided its capacity, design and construction conformed with District standards. That necessarily implies that the basin is designed as an on-channel basin with a capacity of at least 15-acre feet.

4.3-1(g) *Detention basins must be developed concurrently with construction in the affected watersheds. They should be completed with the first phase of construction. Alternatively, construction of a detention basin may be phased, so that its volume is adequate to mitigate the runoff effects of graded and developed areas in the project.*

4.3-1(h) *The East Branch basin should be designed as an efficient sediment trap.*

4.3-1(i) *The Tassajara Creek basin site should provide surplus space (approximately two acres) for disposal of sediment removed from the basin during routine maintenance.*

4.3-1(j) *The design of detention basins should include features to avoid ponding stagnant water. The maintenance plan for each basin should include measures to control mosquito populations, dust and wildfire hazards.*

4.3-1(k) *The development in the northern portion of the project should not be allowed to increase peak flows through the inadequate portion of Tassajara Creek (i.e., reach between the Foley property and the Johnston Road bridge).*

4.3-1(l) *Because the Tassajara project will significantly increase the total volume of runoff in the post-development condition, detention basins should be over-sized to reduce peak flows below the existing peak flows at the County line.*

Safety Hazard

Impact 4.3-2 Whether or not the detention basins are intended for recreational use, their proximity to residential development results in a potential safety hazard.

Although the proposed flood control facilities are expected to detain runoff only a few times each year, unrestricted access between residential developments and the basins could be hazardous during these periods. The most hazardous features of the basins would be the areas adjoining outflow structures,

including the areas of debris catchers (trash racks) in front of these openings. Additionally, the channels of Tassajara and East Branch Creeks may be hazardous at and just below the basin outfall structures.

Mitigation Measures

4.3-2 *Minimum mitigation should include the provision of fencing and signing, specifically around both inlet and outflow structures, and designing of trash racks to prevent access to the outfall structures by children. Additional access restrictions that should be considered include: a) install 4-foot-high chainlink fences around the basins, even if they are improved as park or nature areas, b) equip fence gates with latching devices which cannot be readily operated by small children, c) provide hazard warning signs at gates, and d) keep gradients within basins at a slope of 4:1 (horizontal to vertical) or flatter.*

If a local park agency takes over responsibility for the proposed basins and/or the Tassajara and East Branch Creek channels for passive or active uses, (e.g., trails, recreation), fencing should be adapted to standards appropriate for the intended activities.

Erosion Hazard/Bank Retreat

Impact 4.3-3 High velocities of runoff during flood flows have the potential to cause significant erosion of creek banks, possibly resulting in damage to public and private property.

Hydrologic studies performed by Balance Hydrologics, indicate that the velocity of runoff during the 100-year event will locally be as high as 12 to 17 feet per second, and broad segments of the creek will be characterized by velocities greater than 7 feet per second (f/s). Moreover, the EIR consultant analyzed a segment of Tassajara Creek and found that peak runoff from the two-year storm would yield velocities in excess of 5 f/s.

Caltrans has developed recommended permissible velocities for unlined channels as a function of soil conditions in the creek banks. For stiff clay, intermittent velocities of up to 5 f/s are permissible; for creek banks consisting of gravels mixed with loam, velocities of up to 6.5 f/s are permissible. The proposed project intends to protect improvements by restriction of land use (i.e., adhering to the structural setback requirements of Ordinance 89-28). However, where there is an abrupt change in the alignment of the channel, the outside creek bank will be subject to erosion during episodes of heavy runoff. If unchecked, these erosion problems could ultimately undermine a public road and associated utilities; or it could result in loss of the yard area of a private residence. The available data indicate that erosion of creek banks could also be a hazard on the East Branch of Alamo Creek.

For the Tassajara project, County Ordinance Code, Title 9, Section 914-6.202 requires that maximum design velocities for natural channels should be those specified by a licensed geotechnical engineer. It can be anticipated that future geotechnical reports for construction projects will be required to provide allowable velocities.

In summary, the permissible velocities for Tassajara and East Branch Creeks can be approximated to be 4 to 5 f/s for sustained flows and 5 to 6.5 f/s for intermittent flows. These velocities appear to be lower, on average, than the anticipated velocities for high runoff events (10-year storm and higher).

Mitigation Measures

The following mitigation measures are required to reduce the impact of erosion hazard to a less-than-significant level.

4.3-3(a) *The hydrologic studies that are normally required with the final development plan should evaluate critical areas that are vulnerable to progressive erosion, and these studies should determine velocities. These studies should be done in combination with the final design of the detention basins. (The Flood Control District may provide hydrologic data or calculations, at a cost, to the applicant.)*

Depending on the amount of setback and proposed uses adjacent to the structural setback, aggressive measures may be needed to control erosion. Potential measures include drop structures to control stream gradient; or structural/biotechnical[4] *slope stabilization measures to control the rate of erosion.*

It should be recognized that structural or structural/biotechnical measures designed to slow velocities or control erosion may have secondary impacts on biotic resource values. The use of structural/biotechnical measures within the creek channel may affect the "n" value used to calculate the predicted peak flow increases at the County line, as discussed on page 4.3-31. This is another possible secondary impact.

4.3-3(b) *A maintenance district should be formed to assume the responsibility for remediation of bank retreat problems that threaten improvements over the useful life of the project. The Geologic Hazard Abatement District recommended in Section 4.2 could be charged with this responsibility.*

[4] Structure biotechnical slope protection entails the use of mechanical elements (structures) in combination with biological elements (plants) to prevent slope failures and erosion. The mechanical and biological elements function together in an integrated and complementary manner.

Existing Flow Constraints from Bridges and Culverts

Impact 4.3-4 Undersized culverts, bridge foundations and other in-channel obstructions could restrict flood flows, causing floodwaters to overtop creek banks in localized areas.

In the southern portion of the project there is an existing private bridge at a driveway crossing of Tassajara Creek. Although it would be overtopped by peak flood flows, the bridge is well below the banks on either side of Tassajara Creek and would not cause overbank flooding.

The Camino Tassajara and Highland Road bridges are adequate to carry peak runoff without being overtopped. The Johnston Road abutments are being undermined by erosion. All three of these bridges are proposed to be replaced as a part of planned road improvements. The County is currently in the process of replacing Camino Tassajara bridge. Construction will be completed in 1996. The Highland Road and Johnston Road bridges are scheduled to be replaced in 1996. If the Tassajara project is approved, additional bridge improvement projects will be required.

Farther upstream, within the existing (off-site) Finley Road neighborhood, there are concrete box culverts and corrugated metal pipe culverts for driveway crossings of Tassajara Creek. These structures typically have capacities of 900 to 1,100 cfs, which is 40 to 50 percent of the 100-year peak flows. In this reach the natural channel has capacities of 1,400 to 2,000 cfs, which is less than the calculated 100-year flow of 2,270 cubic feet per second.

The construction of a detention basin on the Foley property, which would reduce peak flows below existing flows on the reach of Tassajara Creek through the Finley Road neighborhood. When the design of the detention basin is finalized, the existing flooding problem will be ameliorated, but it may not be eliminated.

In summary, the lands within the Tassajara project are not generally vulnerable to flooding from the 100-year storm, either under existing conditions or following buildout of the project. Nonetheless, if the additional peak runoff from development is not kept out of the flood-prone reaches of the channel, the project development could exacerbate the flooding problem within the Tassajara Valley. The reaches of concern are upstream of Johnston Road. The Balance Hydrologics study indicates that this reach will experience increased peak flows of 40 to 50 cfs as a result of the planned development if no detention is provided.

There are no existing constrictions on the East Branch of Alamo Creek within the project area. Development of 468 acres in the East Branch watershed, along with construction of the proposed detention basin, would have a profound effect on the extent of flooding and on the accuracy of the FEMA Flood Insurance Rate Map.

Mitigation Measures

The following mitigation measures are required to reduce the impact of restricted flood flows to a less-than-significant level.

4.3-4(a) *Bridges should be sized to not constrict flows, particularly during peak runoff events. Design of bridges should be performed by a registered civil engineer.*

4.3-4(b) *Maps should be prepared showing the extent of the flooding downstream from the proposed detention basins upon completion of final design work for the basins. Those maps, along with supporting hydrologic data, should be provided to FEMA, along with a formal request for amendment of the Flood Insurance Rate Map.*

Water Quality and Internal Drainage Facilities

Impact 4.3-5 Runoff from urbanized areas contains elevated levels of pollutants. These pollutants have the capacity to impact water quality in Tassajara and East Branch Creeks.

Urban runoff can carry a variety of accumulated toxic pollutants such as oil and grease, heavy metals, sediment, pesticide residues, and fecal coliform bacteria from roadways, parking lots, rooftops, and other surfaces and deposit them in adjacent waterways. Pollutant concentrations in urban runoff are extremely variable and are dependent on storm intensity, land use, elapsed time since the previous storm, and the volume of runoff generated in a given area that reaches a receiving water. The most critical time for urban runoff effects would be in the fall under low flow conditions. Pollutant concentrations are typically highest during the first increment of runoff after a dry season, known as the "first flush."

Pollutant loadings from urban runoff are highly variable but noteworthy for having a significant detrimental impact on aquatic environments. The data considered the best available for application to urban runoff in this area are from a study funded by EPA for the Nationwide Urban Runoff Program (NURP) in Fresno, California, conducted by the U.S. Geological Survey (USGS) and the Fresno Metropolitan Flood Control District in 1983. This study analyzed storm runoff from four land use types and quantified the concentrations of various constituents considered important in evaluating the water quality of urban runoff. The water quality parameters analyzed and the median concentrations found in the NURP study are shown in Table 4.3-7. Pollutants found in urban runoff include lead, copper and sediment. Organic compounds were not included in the study.

Maintenance is essential if water quality basins are to function as designed. It is critical that the design of water quality basins takes into account potential maintenance problems. Routine maintenance must be efficient and cost effective. That, and not initial construction cost, must govern the design.

TABLE 4.3-7
MEDIAN POLLUTANT CONCENTRATIONS IN URBAN RUNOFF FOR SELECTED CONSTITUENTS BASED ON LAND USE

Runoff Constituent	Commercial	Multiple Dwelling Residential	Single Dwelling Residential
Total dissolved solids (mg/1)	39	32	34
Suspended sediment (mg/1)	57	333	70
5-day biochemical oxygen demand (mg/1)	5.6	7.2	8.3
Dissolved nitrogen as NO_2 and NO_3 (mg/1)	0.55	0.60	0.5
Total orthophosphate (mg/1)	0.09	0.27	0.22
Dissolved lead (mg/1)	12	12	5
Total recoverage lead (mg/1)	100	170	170
Dissolved copper (mg/1)	4	5	5
Total recoverage copper (mg/1)	18	22	14

Source: U.S. Geological Survey Report No. 84-710. Fresno Nationwide Urban Runoff Project.

Mitigation Measures

All of the following mitigation measures are required to reduce the impact of urban runoff to a less-than-significant level.

4.3-5(a) *All drain outlets should be constructed with energy dissipation structures, if needed, to prevent erosion.*

4.3-5(b) *Internal drainage facilities in neighborhoods should be sized to convey peak runoff from the 10-year storm, provided the volume in excess of design capacity does not result in inundation or ponding of water on private property. The size and design of water quality basins should be based on the acreage of their drainage area and the water quality objectives of the NPDES program.*

4.3-5(c) *During the processing of tentative maps, the applicant should show the location and size of water quality basins and grassy swales. Hydrology data and preliminary design information for basins should be required at that time.*

4.3-5(d) *The conditions of approval for tentative maps should require a maintenance plan and a monitoring plan. An entity such as a Geologic Hazard Abatement District should have responsibility for maintenance of water quality basins and other private drainage facilities in the project.*

4.3-5(e) *The Biological Resources section contains mitigation measure 4.4-3(a) which calls for all wildlife corridors to contain unlined drainage channels. (The general locations for these facilities are shown in Figure 4.4-4.) The design of these drainage facilities should complement the private drainage facilities and water quality basins in the project.*

Increased Erosion During Grading

Impact 4.3-6 Implementation of the project would require extensive grading throughout lands proposed for development, resulting in an increase in site erosion.

Construction and grading activities could temporarily cause significant increases in site erosion associated with storm runoff. Sediment-laden runoff entering nearby drainages is capable of causing increased channel siltation and reduced flood carrying capacity downstream.

These water quality impacts are considered significant because increased erosion may degrade downstream aquatic habitat and resources and exacerbate existing flood problems downstream. In the East Branch watershed, one resident of the Lawrence Road neighborhood operates an off-channel pond, which was established with permits from the California Department of Fish and Game. This pond, which was established for a commercial fishery use, was overwhelmed by sediment released into the downstream channel by grading operations on the Shadow Creek project.

It should be recognized that Shadow Creek's grading was done with a grading permit, and that the permit required implementation of an approved erosion control plan. The failure of erosion control measures in that project illustrates the difficulty in installing and maintaining erosion control measures over the duration of a winter rainy season. As mentioned previously, erosion control involves reseeding/revegetation of graded areas, effective measures to trap sediment, and where possible, providing an ungraded buffer between the creek and the construction project. A particular problem for the project area is that the sedimentary rocks being graded are fine-grained. When disturbed by earthwork, many of the sediments released are clays. They are exceedingly difficult to trap in detention basins because they can stay in suspension for more than 24 hours.

Mitigation Measure

4.3-6 *An erosion control plan as described in Section 4.2, Impact 4.2-8 should be required with each grading permit application. Because buildout is expected to occur over a long time period (15 years or more), the erosion control plan should make provision for qualitative and quantitative monitoring of the effectiveness of the erosion and sediment control measures, especially parameters that examine a) success of revegetation, b) efficiency of sedimentation basins, and c) sediment load downstream from the graded area, in the channels of Tassajara and East Branch Creeks. Such monitoring would provide the opportunity to modify and refine the erosion control plan through time.*

Hazardous Material Spills During Construction

Impact 4.3-7 Because project construction would require the use of gasoline- and diesel-powered heavy equipment, hazardous materials could spill on-site and wash into nearby drainages.

Scrapers, bulldozers, compactors, backhoes and other earthmoving equipment, along with water pumps, air compressors and construction materials, will be used on-site. Chemicals such as gasoline, diesel fuel, lubricating oil, hydraulic oil, lubricating grease, automatic transmission fluid, paints and solvents will be on-site during construction activities. An accidental spill of any of these substances could degrade the water quality of surface waters in the drainage systems both on and off the project site.

Mitigation Measure

4.3-7 *The County should require a hazardous substance control and emergency response plan as a condition of the grading permit. The plan (HSCP) should prescribe procedures aimed at reducing the potential for significant impacts on water quality caused by a chemical spill, require safe collection and disposal of hazardous substances generated during construction activities and include an emergency response program to ensure quick and safe cleanup of accidental spills. The plan should identify areas where refueling and vehicle maintenance activities are allowed. Any hazardous materials to be stored on-site are to be shown on a map accompanying this plan. Measures to control access, prevent spills and protect the materials overnight and on weekends must also be described.*

Use of Treated Effluent In Landscape Irrigation

Impact 4.3-8 Runoff from recycled-water irrigated areas has the potential to contribute to water quality degradation both within and downstream from the planning area.

State regulations require control of runoff from recycled-water irrigated areas during non-storm periods. They recognize that runoff from such areas will occur during storms, and allow it, provided that beneficial uses are not impaired. A waste-discharge permit is required for the operation of any treated-effluent irrigation program, with storm runoff being one of many elements considered during permit review.

Ultimately, the quality of storm runoff from recycled-water irrigated areas will depend upon the site, the composition and rate of application, the quality of the applied water, and the design and operation of the system. Each of these questions are addressed in specific standards and investigations required under California Code of Regulations, Title 22, Division 4, Chapter 3, (updated January 1993). These require consideration of certain constituents (such as bacteria or oxygen demand) which are seldom sampled during storms.

A baseline water quality study performed by Balance Hydrologics indicates that, under existing conditions, water quality in Tassajara and East Branch Creeks is relatively good at present. Consequently, they are generally suited to receiving relatively small amounts of storm runoff from irrigated areas with properly designed and managed recycled-water irrigation systems.

Mitigation Measure

4.3-8 *If use of recycled water is included as a component of the project, storm runoff quality should be evaluated in terms of water quality objectives for the creeks and the standard set by regulatory agencies. Specific mitigation measures must await at least conceptual design for recycled-water irrigation systems.*

Golf Course

Impact 4.3-9 Chemical use on golf courses and landscaping can adversely impact the quality of runoff and receiving waters.

With environmentally sensitive design and management, a golf course can be a recreational asset to the surrounding community and contribute to enhancement of wildlife habitat values in adjacent open spaces. Increasingly, as the environmental effects of golf courses receive greater attention and public concerns over chemical usage and resource conservation focus on easily identifiable sources, managers of Country Clubs are called on to demonstrate an active commitment to avoidance of adverse effects. The water quality study for this project identified several measures to control adverse water quality effects of the golf course. These are identified below as mitigation measures for the project.

Mitigation Measures

All of the following mitigation measures should be implemented to maintain the quality of the water:

4.3-9(a) *Identify the specific local resources and beneficial uses that might require protection and the pertinent policies, practices and regulations. Also evaluate specific constituents which might be delivered from chemical use to impacts resulting from that delivery. The results of this analysis would be standards and criteria for protection of water quality.*

4.3-9(b) *Prepare a list of commercially available pesticides, rodenticides, insecticides, fungicides, and herbicides for use at this site based on their efficacy, toxicity, mobility and persistence as reported in the literature. Provide guidelines for the manner and means of applying these recommended pesticides, including controls or restrictions to be imposed on their use. These are based on the projected requirements of different portions of the golf course (tees, greens and fairways), field conditions at the time of*

application, the potential health impacts of each chemical to humans and wildlife, and the relative vulnerability to pesticide insult of the aquatic and terrestrial resources found in each subdrainage.

4.3-9(c) *Develop criteria for fertilizers recommended for use based on their efficacy and susceptibility to leaching. Guidelines for fertilizer application should be provided.*

4.3-9(d) *Requirements for handling and storage of materials subject to regulations (siting criteria, not a hazardous materials management plan) should be outlined, including how the County and public will be notified of proposed changes in golf course operations.*

4.3-9(e) *General golf course and landscaping design criteria should be developed to promote protection of wetlands, and ground and surface waters from contamination carried in surface runoff.*

4.3-9(f) *Golf course or landscaped area design criteria should be based on a consideration of site characteristics. The design should promote water conservation, reinforce chemical management recommendations, enhance protection of ground and surface waters from contamination by irrigation waters. It should also be consistent with any native plant restoration and revegetation efforts.*

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4.4 BIOLOGICAL RESOURCES

INTRODUCTION

Methodology

Identification of the biotic resources occurring within the project area was based primarily on the review and compilation of existing information, including detailed studies conducted by the applicant's consulting biologist, Sycamore Associates. The review provided information on general resources in the area, the extent of sensitive natural communities, jurisdictional wetlands, and the distribution and habitat requirements of special-status taxa[1] which have been recorded or are suspected to occur in the project vicinity. Studies conducted by the applicant's consulting biologist included an opportunities and constraints analysis which describes the existing vegetation and wildlife resources in the project area (Sycamore Associates, 1992a), and reports summarizing surveys conducted for San Joaquin kit fox, amphibians and other wildlife species of concern (The Habitat Restoration Group and Sycamore Associates, 1992), supplemental surveys for California tiger salamander (Sycamore Associates, 1993), supplemental surveys for special-status plant populations (Sycamore Associates, 1992b), and supplemental surveys for invertebrate species of concern (Entomological Consulting Services, 1994). Other information sources included the *Draft EIR for the Dougherty Valley General Plan Amendment* (Contra Costa County, 1992), the *Draft EIR on the North Livermore General Plan Amendment* (Willdan Associates, 1993), the *Draft EIR on the Los Vaqueros Vasco Road and Utility Relocation Project* (Jones & Stokes Associates, 1990), and occurrence records for special-status taxa and sensitive natural communities for southeastern Contra Costa County and northeastern Alameda County maintained by the California Natural Diversity Data Base (CNDDB).

Field reconnaissance surveys of the project area were conducted by the EIR consulting biologist for this Draft EIR, including site visits on 4 October 1993, 17 and 19 November 1993, and 27 January 1994. The field reconnaissance surveys served to confirm the assessments conducted by the applicant's biologist regarding plant cover, wildlife species which may occur in or frequent the area, and the presence or potential for populations of special-status taxa. The reconnaissance surveys were conducted

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1 Special-status taxa include: designated rare, threatened, or endangered and candidate species for listing by the California Department of Fish and Game (CDFG); designated threatened or endangered and candidate species for listing by the U.S. Fish and Wildlife Service (USFWS); taxa considered to be rare or endangered under the conditions of Section 15380 of the *California Environmental Quality Act (CEQA) Guidelines* (State of California, 1992), such as those plant taxa identified on lists 1A, 1B and 2 in the *Inventory of Rare and Endangered Vascular Plants of California* (California Native Plant Society, 1988); and possibly other taxa which are considered sensitive or of special concern due to limited distribution or lack of adequate information to permit listing or rejection for state or federal status, such as those included on list 3 in the California Native Plant Society *Inventory* or identified as animal "Species of Special Concern" by the CDFG.

primarily by automobile from roads throughout the project area, with spot checking by foot of sensitive features such as creek corridors, woodlands and ponds.

Additional detailed field mapping and pre-construction surveys have been recommended where appropriate to confirm the presence or absence of sensitive resources during future environmental review of specific development plans. Access to portions of the project area such as the Rapp property was denied during preparation of the Draft EIR and the occurrence of sensitive resources could not be confirmed in some locations. Similarly, field verification of potential wetlands conducted by representatives of the U.S. Army Corps of Engineers was not possible where access to certain parcels was not permitted by property owners. Further study and evaluation will be necessary during future environmental review of properties where verification and confirmation was not possible due to restricted access.

Previous Studies

Several detailed studies have been conducted and reports prepared by the applicant's consulting biologist which document the biological and wetland resources within the project area. The first of these was a resource inventory conducted as part of an opportunities and constraints analysis to be used during preparation of the *Preliminary Development Plan*. The resulting report, *Tassajara Valley Vegetation and Wildlife Resources, Existing Conditions and Opportunities and Constraints* (Sycamore Associates, 1992a), provides a description of the plant communities and wildlife habitat, information on the occurrence of special status plants, animals, and sensitive natural communities, the extent of potential wetlands and other jurisdictional "waters of the U.S." following delineation methods set forth by the U.S. Army Corps of Engineers (Corps).[2] It also contains an evaluation of constraints to development and opportunities for establishing new natural communities, restoring degraded areas and enhancing the wildlife habitat of proposed open space and developed areas.

Field surveys for the *Opportunities and Constraints* analysis were conducted in December 1991. Supplemental surveys were recommended by Sycamore Associates to provide confirmation on the presence or absence of special-status plant and animal species requiring detailed studies or species which could not be identified during winter months. Additional detailed surveys for selected wildlife species of concern were performed in April, May and June of 1992, focusing on San Joaquin kit fox, California tiger salamander, California red-legged frog and western spadefoot toad. The occurrence of other wildlife species of concern was also addressed during the kit fox and amphibian surveys. The results of the supplemental survey effort were summarized in the report, *Surveys for San Joaquin Kit Fox,*

[2] The CDFG and Corps have jurisdiction over modifications to river banks, lakes, stream channels and other wetland features. Jurisdiction of the Corps is established through the provisions of Section 404 of the Clean Water Act, which prohibits the discharge of dredged or fill material into "waters" of the U.S. (including wetlands) without a permit (individual or nationwide). Jurisdictional authority of the CDFG over wetland areas is established under Sections 1601-1606 of the Fish and Game Code, which pertains to activities which would disrupt the natural flow or alter the channel, bed or bank of any lake, river or stream, and requires an agreement identifying appropriate mitigation before any disturbance is allowed by the Department.

Amphibians, and Other Wildlife Species of Concern (The Habitat Restoration Group and Sycamore Associates, 1992).

In response to concerns expressed by representatives of the CDFG, supplemental surveys were conducted in the spring of 1993 to determine the presence or absence of California tiger salamander following the end of the recent drought which may have influenced the 1992 survey results. Supplemental surveys were conducted in March, April and May of 1993, and the results were summarized in the report, *Spring 1993 Surveys for California Tiger Salamander, Tassajara Valley, Contra Costa County* (Sycamore Associates, 1993).

Refinement of the extent of wetlands and other waters in the project area was made during the verification process with the Corps for those parcels where access was permitted. Jurisdictional wetlands and waters were initially mapped during preparation of the *Opportunities and Constraints* analysis. Representatives of the Corps conducted a field verification in October of 1993 to review the methods and results of the preliminary mapping effort by Sycamore Associates. Adjustments were made to the final delineation map and wetland acreage for the project area based on recommendations made by Corps representatives (Sycamore Associates, 1992c).

During preparation of this Draft EIR, each of the reports prepared by the applicant's biologist was reviewed for adequacy and need for any supplemental survey effort to confirm the presence or absence of special-status species. The surveys appear to address most of the special-status plant and animal taxa of concern, extending through appropriate seasons to permit detection, and following accepted protocol at the time they were conducted. However, no detailed surveys for invertebrates species of concern had been conducted by late 1993, and supplemental surveys were recommended for three special-status insect species suspected to possibly occur in the project area. Supplemental surveys were conducted in March, April and May of 1994, with the results summarized in the *Report on Status Surveys for Candidate Insects* (Entomological Consulting Services, 1994).

SETTING

Vegetation and Wildlife Habitat

Vegetation in the project area forms a mosaic of primarily non-native grassland and valley oak woodland, with riparian forest, willow scrub and marshland communities occurring along Tassajara and Alamo creeks, based on the classification system of terrestrial natural communities developed by the California Natural Diversity Data Base (CNDDB) (1986). Non-native grassland and agricultural fields used for dryland farming form the predominant cover types, typical of the rolling hills of southeastern Contra Costa County. Woodland occurs primarily on north-facing slopes, with large oaks also occurring as individual and scattered trees in some areas, forming an open savanna with the non-native grasslands. Riparian forest occurs along the northern portion of the Tassajara Creek corridor, and willow scrub occurs sporadically along both the Tassajara and Alamo creek corridors. In addition to areas cultivated with hay and grain crops, walnut orchards occupy a small portion of the floor of Tassajara Valley and ornamental vegetation has been planted around existing residences, including small

groves of eucalyptus. Figure 4.4-1 indicates the extent of each of the plant communities and other biotic features. Table 4.4-1 summarizes the extent of each plant community and associated wildlife habitat within the project area.

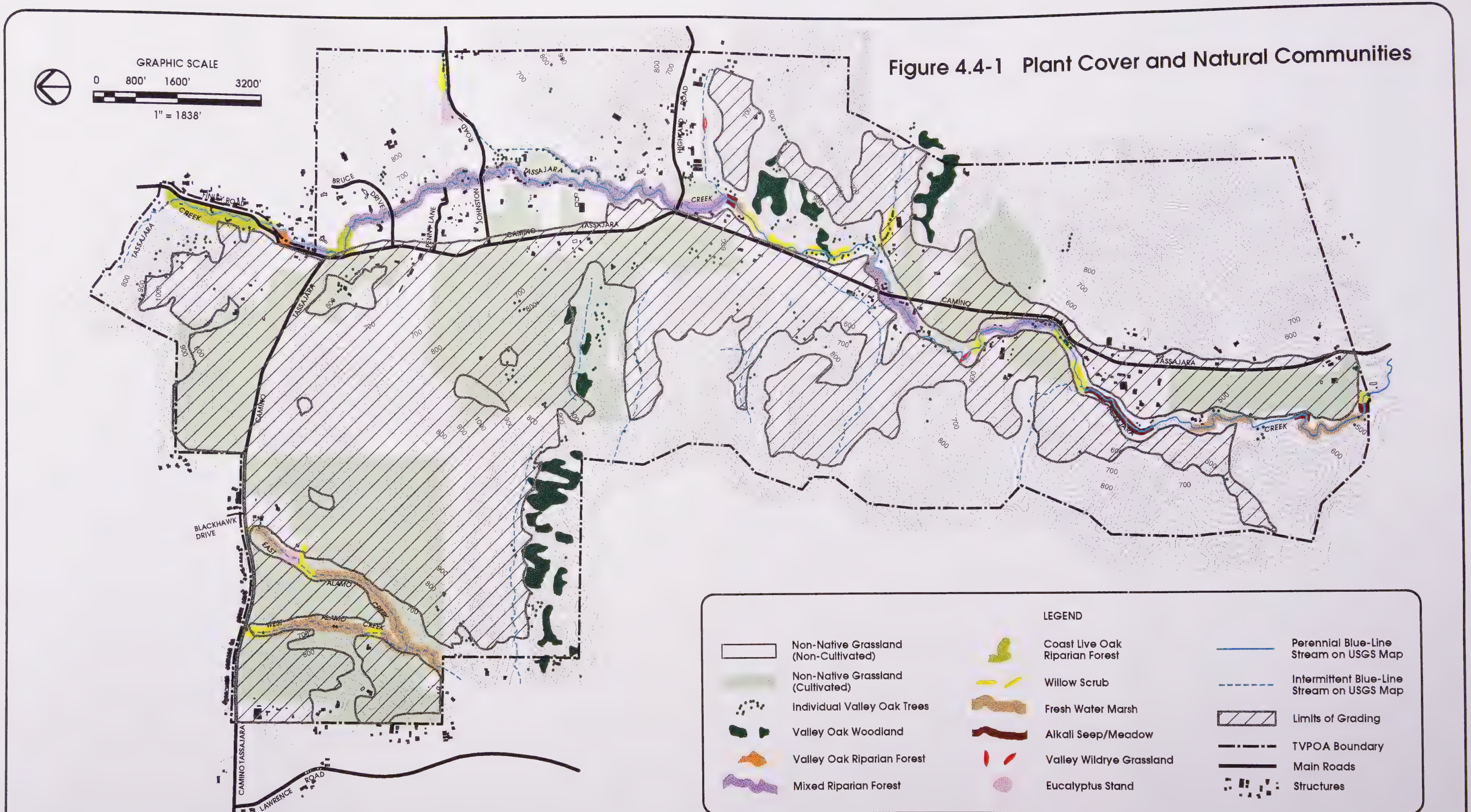
TABLE 4.4-1
WILDLIFE HABITATS AND PLANT COMMUNITIES IN PROJECT AREA

Wildlife Habitat	Plant Community Type*	Area (Acres)
Grassland	Non-native grassland	3466
	Valley wildrye grassland	0.13
Woodland	Valley oak woodland	174.3
Riparian	Mixed riparian forest	32.3
	Live oak riparian forest	13.1
	Valley oak riparian forest	1.2
	Willow scrub	9.3
Marsh	Valley freshwater marsh	2.6
	Alkali seep	1.0
	Valley freshwater seep	0.01

Note: * Excludes areas of dryland farming, walnut orchards, eucalyptus groves and ornamental landscaping associated with rural residences, which make up the remainder of the project area.

Source: Sycamore Associates, 1992a.

The project area supports a diverse assemblage of native and non-native plant species, and all but the non-native grassland community has been identified as having a high inventory priority with the CNDDB. Riparian and other wetland-related habitat are generally considered to be sensitive because they tend to provide important resources to wildlife, and areas of well-developed cover serve as movement corridors. The woodland and savanna communities are composed of trees which may live to be 300 years or more in age, and are of concern because of their long maturation time and sensitivity to grading, and their importance as nesting, roosting and cover for wildlife. Even the non-native grasslands, although they do not represent a unique habitat type, provide important foraging opportunities for numerous species of raptors and large mammals. Characteristics of the plant communities occurring within the project area are summarized below.



SOURCE: SYCAMORE ASSOCIATES, ENVIRONMENTAL COLLABORATIVE, USGS

Non-Native Grassland

Grassland vegetation is composed primarily of introduced annual grasses and forbs and comprises the majority of the vegetation on the project site (see Figure 4.4-1). Intensive grazing in the project area and throughout California has dramatically altered the composition of the grassland community over the past 100 years, eventually replacing most of the native perennial bunchgrasses with non-native annuals. Grazing and agricultural development, including discing and tilling associated with dryland farming, may have also diminished the extent of sensitive natural communities which occur in the project vicinity, including valley sink scrub, alkali meadow, alkali grassland and northern vernal pool. Small remnants of valley wildrye grassland, characterized by dense stands of creeping wildrye (*Elymus triticoiedes*) occur along the low terraces of Tassajara and Alamo creeks and at scattered locations on the hillsides.

Species common in the grasslands of the project area today include: wild oat (*Avena barbata*), soft chess brome (*Bromus mollis*), ripgut brome (*B. diandrus*), wild barley (*Hordeum leporinum*), annual rye grass (*Lolium multiflorum*), and fillaree (*Erodium circutarium*). Native species are generally limited to scattered perennial forbs such as blue-eyed grass (*Sisyrinchium bellum*), wild-hyacinth (*Brodiaea pulchella*), California poppy (*Eschscholzia californica*), and soap plant (*Chlorogalum pomeridianum*). Weedy or ruderal species form the predominant cover where recent grading or tilling has occurred, or grazing and trampling by cattle has been particularly severe. Common ruderal species include: yellow star thistle (*Centaurea soltitialis*), bristly ox-tongue (*Picris echioides*), bull thistle (*Cirsium vulgare*), black mustard (*Brassica nigra*), and sweet fennel (*Feoniculum vulgare*).

The value of the grasslands to wildlife is dependent upon the availability of cover, food, water and the connectivity between this habitat type. Grazing continues to influence the value of the grasslands in the project area. Grasslands not used for grazing or dryland farming tend to have a denser cover and a higher species diversity of both plant and associated wildlife species. Areas of heavy overgrazing and trampling by cattle tend to have little habitat value, with limited plant cover of primarily ruderal species.

The grasslands support numerous insects, small mammals and birds, and provide important foraging habitat for predatory mammals and birds. Many species use the grassland for only part of their habitat requirements, foraging in the grassland and seeking cover in adjacent woodlands or riparian corridors. Mammal and reptile species that forage and breed in the grasslands include: California ground squirrel, California vole, Botta pocket gopher, black-tailed jackrabbit, common garter snake, western fence lizard, northern alligator lizard and gopher snake. Grassland vegetation provides food and nesting material, and nesting substrate for numerous species of birds, including mourning dove, American goldfinch, song sparrow, and western meadowlark. The smaller mammals, reptiles and birds are important prey for several species of raptors and predatory mammals which frequent the grasslands of the project area, including red-tailed hawk, great horned owl, American kestrel, turkey vulture, golden eagle, red fox, coyote and American badger.

The expanse of grasslands throughout the project area and the surrounding undeveloped lands contributes to the importance of this habitat type to larger mammals and raptors. Larger wildlife species are able to forage in the grasslands because of the restricted access and limited human activity,

often times dispersing through partially developed areas at night when they are less easily detected. Creek corridors in the valley bottoms serve as important movement corridors between upland grassland foraging habitat. Due to the currently limited development in the Tassajara Valley, wildlife movement is relatively unobstructed across the project area between the Dougherty Valley area to the west, the Black Hills of Mount Diablo to the north and the Collier Canyon area to the east.

Oak Woodland and Savanna

As depicted in Figure 4.4-1, woodland vegetation occurs as scattered groves in the project area. Valley oak (*Quercus lobata*) tends to be the predominant tree species, forming both a closed-canopy woodland and small clusters or isolated specimens in the grassland covered hillsides. Understory vegetation is generally composed of non-native grassland species. Herbaceous species and scattered shrubs and vines such as poison oak (*Toxicodendron diversilobum*), wood rose (*Rosa gymnocarpa*) and common snowberry (*Symphoricarpos rivularis*) sometimes occur in the understory of the woodlands.

The woodlands provide important cover for wildlife, and the vertical distribution of canopy and understory vegetation provides for a greater diversity of wildlife than often found in the adjacent grasslands. The oak woodlands and individual trees provide important perching, roosting and nesting substrate for numerous species of birds, including golden eagle and black-shouldered kite. Dead limbs and cavities in older trees are also often used for nesting, denning and roosting. The abundant seed crops are an important food source for black-tailed deer, scrub and Steller's jays, woodpeckers and other species of wildlife. Due to the relative absence of dense understory vegetation, the occasional isolated shrubs and thickets provide critical cover for larger wildlife, including bedding locations for deer.

Riparian

Riparian plant communities within the project area vary from well-developed forest along the upper reach of Tassajara Creek, to denuded swales which are often indistinguishable from the surrounding non-native grasslands. North of the Tassajara Road crossing, Tassajara Creek supports mixed riparian forest, central coast live oak riparian forest, valley oak riparian forest, and willow scrub plant communities. Live oak (*Quercus agrifolia*) dominates the riparian forest along most of Tassajara Creek. Other tree and shrub species include: red willow (*Salix laevigata*), valley oak, California buckeye (*Aesculus californica*), box elder (*Acer negundo* ssp. *californica*), sycamore (*Platanus racemosa*) and cottonwood (*Populus fremontii*). Understory vegetation varies with each community type, from areas of dense poison oak, blackberries (*Rubus* spp.), and wild grape (*Vitis californica*) in the mixed riparian forest, to largely barren ground under the dense live oak riparian forest.

Red willow, yellow willow (*S. lasiandra*) and arroyo willow (*S. lasiolepis*) form willow scrub along segments of the lower reaches of Tassajara Creek and sporadically along Alamo Creek. Other plant species associated with the scrub include annual grasses and forbs, thickets of blackberry, wild rose and poison hemlock (*Conium maculatum*). Where surface water is not a limiting factor, intensive grazing and trampling by cattle have most likely limited the spread of willow and prevented the establishment

of well-developed riparian vegetation along much of the two main creeks and minor tributary drainages in the project area. Occasionally, small clumps of willow occur on hillside slopes in the vicinity of freshwater seeps, but understory vegetation is generally absent in these locations because of high cattle use.

Factors affecting the value of riparian habitat to wildlife include the extent of protective cover, complexity of vegetation, availability of surface water, the proximity of existing development and potential for disturbance by automobile traffic, humans and their pets. Tassajara and Alamo creeks form the two major riparian corridors through the project area, supporting areas of well-developed forest and scrub vegetation, and perennial sources of water. Trees and shrubs provide important nesting and foraging habitat for numerous species of birds such as warbling vireo, ruby-crowned kinglet, dark-eyed junco and California quail. The main creeks and tributary drainages serve as important movement corridors for larger wildlife species, particularly where dense growth provides protective cover on the valley floors.

Marsh, Seeps, and Aquatic Habitat

Figure 4.4-1 illustrates the occurrences of the freshwater marsh communities in sections of Alamo and Tassajara creeks where permanent surface water supports perennial emergent vegetation, composed primarily of cattail (*Typha latifolia* and *T. angustifolia*), rushes (*Juncus* spp.) and sedges (*Carex* spp.). One of the larger areas of freshwater marsh occurs along the west fork of Alamo Creek, forming a dense stand of cattail along the creek. Runoff from landscape irrigation in the Shadow Creek and Blackhawk developments has contributed to perennial flows in Alamo Creek, and has most likely contributed to the successful establishment of the cattail thickets along the lower stretches of the creek.

Freshwater seeps are scattered throughout the ravines and hillside slopes of the project area, supporting the rushes, sedges and other species characteristic of a freshwater marsh but generally with little or none of the ponding necessary to support emergent vegetation such as cattail. The seeps occur where the water table has been truncated and flows to the surface, such as the toe of deeply incised channels, on steep slopes prone to landsliding and erosion, and at the head of drainage swales.

Small areas of alkali meadow and alkali seeps occur along the lower reach of Tassajara creek. Dominant species associated with the seeps include common rush (*Juncus balticus*), saltgrass (*Distichlis spicata* var. *stricta*) and prickle grass (*Crypsis niliacea*). Intensive grazing and trampling by cattle have most likely eliminated many of the plant species which typically characterize this community type. The CDFG now considers alkali sink scrub and alkali seeps to be highly sensitive communities because they often support unique plant and animal taxa, and because of their continued reduction in extent.

Aquatic habitat throughout the project area includes the perennial and intermittent creeks, stockponds and seeps. The perennial and seasonal waters and associated wetlands provide important habitat for numerous species of invertebrates, reptiles and amphibians, including special-status taxa such as California red-legged frog which has been reported from a number of locations in the project area. Stockponds were created to provide drinking water for livestock, but now contribute to the wildlife diversity of the surrounding area, providing breeding habitat for amphibians and pond turtle, foraging

habitat for great blue heron, killdeer and other birds, and a source of water for larger mammals. Grazing and trampling by livestock has generally prevented the establishment of marshland vegetation around the perimeter of the ponds, which currently limits their habitat value.

Orchards, Eucalyptus Groves and Rural Development

Areas of agricultural and rural residential development support a non-native cover of hay or grain crops, orchard trees, eucalyptus (*Eucalyptus globulus*) and ornamental landscaping. Areas of dryland farming are similar in habitat value to the surrounding undisced non-native grasslands. The walnut orchards and eucalyptus groves are limited in extent and generally have an understory cover of non-native grassland. While horticultural plantings generally have low value for most native wildlife species, eucalyptus and other large ornamental trees provide important nesting and roosting sites for some bird species, including red-tailed hawk and great horned owl nests reported from eucalyptus groves in the project area. Residential structures and ornamental landscaping provide habitat for several species of birds which are common in suburban areas, such as American robin, house finch, house sparrow, mourning dove and European starling.

Special-Status Taxa

Special-status taxa are plants and animals that are legally protected under the state and/or federal Endangered Species Acts[3] or other regulations, as well as other species that are considered rare enough by the scientific community and trustee agencies to warrant special consideration, particularly with regard to protection of isolated populations, nesting or denning locations, communal roosts and other essential habitat. Species with legal protection under the Endangered Species Acts often represent major constraints to development, particularly when they are wide ranging or highly sensitive to habitat disturbance and where proposed development would result in a "take"[4] of these species.

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3 The FESA of 1973 declares that all federal departments and agencies shall utilize their authority to conserve endangered and threatened plant and animal taxa. The CESA of 1984 parallels the policies of FESA and pertains to native California taxa.

4 "Take" as defined by the Federal Endangered Special Act (FESA) means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect" a threatened or endangered species. "Harm" is further defined by the USFWS to include the killing or harming of wildlife due to significant obstruction of essential behavior patterns (i.e., breeding, feeding, or sheltering) through significant habitat modification or degradation. The CDFG also considers the loss of listed species habitat as "take," although this policy lacks statutory authority and case law support under the CESA.

Two sections of FESA contain provisions which allow or permit "incidental take." Section 10(a) provides a method by which a state or private action which may result in "take" may be permitted. The applicant must provide the USFWS with an acceptable conservation plan and publish notification for a permit in the Federal Register. Section 7 pertains to a federal agency which proposes to conduct an action which may result in "take," requiring consultation with USFWS and possible issuance of a jeopardy decision. Under

The *Opportunities and Constraints* analysis prepared by the applicant's biologist in 1992 provides an overview of the potential for occurrence of special-status taxa in the project area (Sycamore Associates, 1992a). Species suspected to possibly occur in the project area were determined through review of the CNDDB records and available literature, and consultation with specialists. As discussed previously, supplemental surveys were conducted later in 1992, 1993 and 1994 to provide confirmation on the presence or absence of several species of concern. Tables 4.4-2 and 4.4-3 provide information on the plant and animal taxa of concern suspected to possibly occur in the project area.

Plant Taxa of Concern

Based on recorded geographic range and presence of suitable habitat, an estimated 30 plant taxa with special status were considered to potentially occur in the project area. A number of other taxa which have been reported from or suspected to occur in the surrounding area of Contra Costa, Alameda and San Joaquin counties were eliminated from further consideration due to the absence of suitable habitat (such as chaparral vegetation) or specific soil characteristics (such as serpentine derived soils) within the project area. Taxa eliminated from further consideration included: Mt. Diablo manzanita (*Arctostaphylos auriculata*), Contra Costa manzanita (*A. pungens* ssp. *laevigata*), chaparral harebell (*Campanula exigua*), Mt. Hamilton harebell (*Campanula sharsmithiae*), Mt. Hamilton thistle (*Cirsium fontinale* var. *campylon*), northcoast bird's-beak (*Cordylanthus maritimus* ssp. *palustris*), Contra Costa wallflower (*Erysimum capitatum* var. *angustatum*), tallus fritillary (*Fritillaria falcata*), Hall's bush mallow (*Malacothamnus hallii*) and Mt. Diablo phacelia (*Phacelia phacelioides*).

Table 4.4-2 provides information on the status, distribution, geographical range and flowering period of each of the 30 plant taxa of concern known or initially suspected to possibly occur in the project area. Of these, seven were considered by the applicant's biologist to have a low to high potential for occurrence in the project area (Sycamore Associates, 1992a). Detailed field surveys were conducted by Sycamore Associates in the spring of 1992 to confirm the presence or absence of special-status plant populations. With the exception of valley oak (*Quercus lobata*), no other taxa of concern were encountered during the supplemental surveys or are believed to occur within the project area (Sycamore Associates, 1992b).

Valley oak occurs in the woodlands, oak savanna, and riparian forests. Until recently, this species was included on List 4 of the California Native Plant Society (CNPS) *Inventory*. List 4 plants are considered to be of limited distribution in California and their vulnerability or susceptibility to threat appears low at this time. The previous edition of the *Inventory* noted that although this species of oak is widespread and relatively abundant, it is threatened by loss of habitat from urbanization and agricultural development in the Central Valley, and regeneration needs monitoring in many areas.

the CESA, "take" can be permitted under Section 2081 of the Fish and Game Code. The applicant must enter into a habitat management agreement with the CDFG, which defines the permitted activities and provides adequate mitigation.

TABLE 4.4-2
SPECIAL-STATUS PLANT TAXA
POTENTIAL OCCURRENCE IN PROJECT AREA

TAXA NAME	STATUS (Fed/State/CNPS)	HABITAT CHARACTERISTICS (Munz & Keck 1973; CNDDB, 1992)	DISTRIBUTION (CNPS 1994) (Presumed Extirpated)	FLOWERING PERIOD (Munz & Keck 1973)
Amsinckia grandiflora Large-flowered fiddleneck	FE/SE/1B	Open grassy slopes below 1,200 feet	Alameda, Contra Costa, San Joaquin	April-May
Amsinckia lunaris Bent-flowered fiddleneck	-/-/4	Valley grassland	Contra Costa, Lake, Marin, Santa Cruz, Shasta, Siskiyou, Sonoma	March-June
Atriplex cordulata Heart-leaved saltbrush	*/-/1B	Akali scrub and grassland	Alameda, Contra Costa, Fresno, Glenn, Madera, Merced, San Joaquin, Solano, Stanislaus, Tulare	May-Oct.
Atriplex joaquiniana San Joaquin spearscale	*/-/1B	Akali meadows and scrub	Alameda, Colusa, Contra Costa, Merced, Napa, Sacramento, San Benito, Solano, Yolo	April-Sept.
Balsamorhiza macrolepis var. *m.* Balsamroot	-/-/1B	Fields and rocky hillsides, up to 2,000 feet	Alameda, Butte, Mariposa, Placer, Santa Clara, Tehama	March-June
Calochortus pulchellus Mt. Diablo fairy lantern	-/-/1B	Wooded and brushy slopes	Contra Costa, Solano	April-June
Chorizanthe robusta var. *r.* Robust spineflower	FE/-/1B	Dry sandy places, below 1,000 feet	Monterey, Santa Cruz (Alameda, Santa Clara, San Mateo)	May-Sept.
Cordylanthus mollis ssp. *hispidus* Hispid bird's-beak	*/-/1B	Alkaline meadows	Alameda, Kern, Merced, Placer, Solano	June-July
Cordylanthus palmatus Palmate-bracted bird's-beak	FE/SE/1B	Alkali scrub and grassland	Alameda, Colusa, Fresno, Yolo (Madera, San Joaquin)	June-August
Cryptantha hooveri Hoover's cryptantha	-/-/4	Bedrock outcrops, dry rocky areas	Alameda, Contra Cost, Madera, Merced, San Joaquin, Stanislaus	April-May
Delphinium californicum ssp. *interius* Hospital Canyon larkspur	*/-/1B	Wet places, foothill woodland	Alameda, Contra Costa, Santa Clara, San Joaquin, San Luis Obispo	April-June
Delphinium recurvatum Recurved larkspur	*/-/1B	Subalkaline soil of brushy or open places	Alameda, Contra Costa, Colusa, Fresno, King, Kern, San Luis Obispo, Solano, Tulare	March-May
Eriogonum truncatum Mt. Diablo buckwheat	-/-/1A	Dry slopes, 1,000 to 1,500 feet, edge of chaparral	Tulare (Alameda, Contra Costa, Solano)	April-June
Eschscholzia rhombipetala Diamond-petaled California poppy	*/-/1A	Open dry areas in grassland or rocky areas	(Alameda, Contra Costa, Colusa, San Luis, Obispo, Stanislaus)	March-April
Fritillaria agrestis Stinkbells	-/-/4	Heavy clay soils in low-lying areas	Alameda, Contra Costa, Fresno, Kern, Mendocino, Monterey, San Benito, Solano	March-April
Fritillaria liliacea Fragrant fritillary	*/-/1B	Coastal scrub and grassland often on ultramafic soils	Alameda, Contra Costa, Monterey, Marin, San Benito, Santa Clara, San Francisco, San Mateo, Solano, Sonoma	Feb.-April
Helianthella castanea Diablo helianthella	*/-/1B	Fringe of woodland, chaparral and scrub	Alameda, Contra Costa (Marin, San Francisco, San Mateo), San Francisco	April-May
Hesperolinon breweri Brewer dwarf flax	*/-/1B	Grassy or brushy slopes, partly shaded, often on serpentine, 400 to 3,000 feet	Contra Costa, Napa, Solano	May-June

TABLE 4.4-2 (continued)

TAXA NAME	STATUS (Fed/State/CNPS)	HABITAT CHARACTERISTICS (Munz & Keck 1973; CNDDB, 1992)	DISTRIBUTION (CNPS 1994) (Presumed Extirpated)	FLOWERING PERIOD (Munz & Keck 1973)
Horkelia cuneata ssp. *sericea* Wedge-leaved horkelia	*/-/1B	Sandy and gravelly places	Monterey, Santa Barbara, Santa Cruz, San Luis Obispo, San Mateo (Alameda, Marin, San Francisco)	April-Sept.
Junglans hindsii Northern California black walnut	*/-/1B	Riparian forests and woodlands	Contra Costa, Napa (Sacramento)	April-May
Lasthenia conjugens Contra Costa goldfield	PT/-/1B	Low flats and borders of vernal pools	Napa, Solano, (Alameda, Contra Costa, Mendocino, Santa Barbara, Santa Clara)	March-April
Madia radiata Showy madia	-/-/1B	Grassy slopes, up to 2,500 feet	Contra Costa, Fresno, Kings, Kern, Monterey, San Benito, San Joaquin, San Luis Obispo	March-May
Micropus amphibola Mt. Diablo	-/-/4	Shallow soil in rocky places	Alameda, Contra Costa, Lake, Marin, Monterey, Napa, Santa Clara, Sonoma	April-May
Plagiobothrys glaber Hairless popcorn-flower	-/-/1A	Salt marshes and alkaline meadows	(Alameda, Marin, Merced, San Benito, Santa Clara)	April-May
Quercus lobata Valley oak	-/-/-	Rich loam, valleys and slopes	Widespread	March-May
Ranunculus lobbii Lobb aquatic buttercup	-/-/4	Shallow vernal pools, low elevations	Alameda, Contra Costa, Marin, Napa, Santa Clara, Solano, Sonoma	Feb.-April
Streptanthus albidus ssp. *albidus* Metcalf Canyon jewelflower	FE/-/1B	Valley grassland, often on ultramafic soils	Contra Costa, Santa Clara, (Alameda)	April-June
Streptanthus hispidus Mt. Diablo jewelflower	*/-/1B	Talus or rocky slopes	Contra Costa	March-June
Trifolium amoenum Showy Indian clover	PE/-/1B	Low rich fields, swales	Sonoma (Alameda, Merced, Marin, Napa, Santa Clara, Solano)	April-June
Tropidocarpum capparideum Caper-fruited tropidocarpum	*/-/1A	Grassy alkaline slopes below 500 feet, last observed in 1957	(Alameda, Contra Costa, Glenn, Monterey, San Joaquin, Santa Clara)	March-April

STATUS DESIGNATIONS:

Federal:
- FE = Listed as "endangered" under the federal Endangered Species Act.
- PE = Proposed for listing as "endangered".
- C = A candidate species under review for federal listing. Includes species for which the USFWS currently has sufficient biological information to support listing as endangered or threatened species.
- * = These species were considered to be category 2 candidate species for federal listing until 28 February 1996 when the USFWS revised their status classification system. These species no longer have any candidate designation, but are unofficially classified as species of concern and could be added to the candidate list if information demonstrates they warrant listing.

State:
- SE = An "endangered" species. Serious danger of becoming extinct throughout all or significant portion of range due to varying factors.

CNPS:
- 1A = Plants of highest priority; plants presumed extinct in California.
- 1B = Plants of highest priority; plants rare and endangered in California and elsewhere.
- 3 = Plants requiring additional information; a review list.
- 4 = Plants of limited distribution; a watch list.

TABLE 4.4-3
SPECIAL-STATUS ANIMAL TAXA
POTENTIAL OCCURRENCE IN PROJECT AREA

TAXA NAME	STATUS Federal/State	HABITAT CHARACTERISTICS (Occurrence within Project Area)
INVERTEBRATES		
Branchinecta longiantenna Longhorn fairy shrimp	PE/-	Grassland vernal pools (suitable habitat absent)
Branchinecta lynchi Vernal pool fairy shrimp	FT/-	Vernal pools (suitable habitat absent)
Hydrocharis rickseckeri Ricksecker's water scavenger beetle	*/-	Ponds, streams, marshes, lakes (not detected during surveys)
Hygrotus curvipes Curved-foot *hygrotus* diving beetle	*/-	Drainages, seeps, wet areas (not detected during surveys)
Ischnura gemina San Francisco forktail damselfly	-/-	Drainages, seeps, wet areas (not detected during surveys)
Linderiella occidentalis California linderiella	PE/-	Vernal pools (suitable habitat absent)
AMPHIBIANS/REPTILES		
Ambystoma tigrinum californiense California tiger salamander	C/CSC	Grassland and open woodlands with temporary or permanent water (not detected during surveys)
Clemmys marmorata Western pond turtle	*/CSC	Ponds, marshes, rivers, and streams (present)
Masticophis lateralis euryxanthus Alameda whipsnake	PE/ST	Scrub/chaparral habitat, and adjacent grasslands, open woodlands, and riparian corridors (suitable habitat absent)
Rana aurora draytoni California red-legged frog	FT/CSC	Permanent ponds, pools, and streams (present)
Scaphiopus hammondi hammondi Western spadefoot toad	*/CSC	Permanent wet areas and adjacent grasslands (not detecte during surveys)
BIRDS		
Agelaius tricolor Tricolored blackbird	*/CSC	Waterways and adjacent grassland and agricultural fields (no nest located but individuals observed during surveys)
Aquila chrysaetos Golden eagle	-/CSC, CP	Open mountains, foothills, and canyons (active nest location and individuals observed during surveys)
Athene cunicularia Burrowing owl	-/CSC	Open grassland and fields, farms, and ruderal areas (suitable habitat present but no breeding pairs observed; evidence of wintering activity detected during surveys)
Buteo regalis Ferruginous hawk	*/CSC	Forages in variety of habitats, but not known to breed in California (wintering individuals observed during surveys)
Circus cyaneus Northern harrier	-/CSC	Marshes, fields, and grassland (nest location and individuals observed during surveys)
Dendroica petechia Yellow warbler	-/CSC	Riparian habitat (no nest located but one male observed during surveys)
Elanus caeruleus Black-shouldered kite	-/CP	Open foothills, marshes, and grassland (nest location and individuals observed during surveys)

TABLE 4.4-3 (continued)

TAXA NAME	STATUS Federal/State	HABITAT CHARACTERISTICS
Eremophila alpestris actia California horned lark	*/CSC	Open habitat with sparse cover (no nests located but individuals observed in breeding season during surveys)
Falco columbariaus Merlin	-/CSC	Forages in variety of habitats, but not known to breed in California (wintering individuals observed during surveys)
Falco mexicanus Prairie falcon	-/CSC	Canyons, mountains, open grassland (nesting habitat absent, not detected during surveys)
Falco peregrinus Peregrine falcon	FE/SE, CP	Canyons, mountains, open grassland (nesting habitat absent, not detected during surveys)
Haliaeetus leucocephalus Bald eagle	FT/SE, CP	Coast, lakes, and rivers (wintering/transient individuals observed during surveys)
Lanius ludovicianus Loggerhead shrike	*/CSC	Open habitat with scattered trees, shrubs, and other perches (One nest located and other individuals observed in breeding season during surveys)
MAMMALS		
Antrozous pallidus Pallid bat	-/CSC	Roosts in caves, crevices, unused structures (maternity roosts absent)
Dipodomys heermanni berkeleyensis Berkeley kangaroo rat	-/-	Foothill grassland, oak/pine woodlands, open chaparral (suitable habitat believed absent)
Eumops perotis californicus California mastiff bat	*/CSC	Caves and crevices in arid areas with high cliffs (roosting habitat absent)
Plecotus townsendi townsendi Townsend western big-eared bat	*/CSC	Cave, mines, and abandoned buildings (roosting habitat absent)
Taxidea taxus American badger	-/CSC	Grassland, oak savanna, and woodland (signs of foraging activity observed but no dens detected during surveys)
Vulpes macrotis mutica San Joaquin kit fox	FE/ST	Alkali sink, saltbrush scrub, grassland, and oak savanna (not detected during surveys)

STATUS DESIGNATIONS:
Federal:
- FE = Listed as Endangered under the federal Endangered Species Act.
- FT = Listed as Threatened under the federal Endangered Species Act.
- PE = Proposed for federal listing as "endangered".
- PT = Proposed for federal listing as "threatened".
- C = A candidate species under review for federal listing. Candidates includes taxa for which the USFWS has sufficient biological information to support a proposal to list as endangered or threatened.
- * = These species were considered to be category 2 candidate taxa for federal listing until 28 February 1996 when the USFWS revised their status classification system. These species no longer have any candidate designation, but are unofficially classified as species of concern and could be added to the candidate list if information demonstrates they warrant listing.

State:
- SE = Listed as Endangered under the California Endangered Species Act.
- ST = Listed as Threatened under the California Endangered Species Act.
- CP = California fully protected species; individual may not be possessed or taken at any time.
- CSC = Considered a species of special concern by the California Department of Fish and Game; taxa have no formal legal protection but nest sites and communal roosts are generally recognized as significant biotic features.

It was removed from the most recent edition, and has no legal protective status under the provisions of CEQA or the state or federal Endangered Species Acts. Mature specimen trees of this and other native tree species are, however, afforded some degree of protection by the County's Heritage Tree Preservation Ordinance (Chapter 816-4) and the Tree Protection and Preservation Ordinance (Chapter 816-6).

Northern California black walnut (*Juglans hindsii*) was historically reported from riparian woodlands, but is currently believed to occur naturally in only two or three remaining stands in Contra Costa and Napa counties. The black walnut was developed and is still used in grafting with the less tolerant English walnut. Black walnut occurs sporadically as young trees along Tassajara Creek and as the base to walnut trees in orchards and near a number of existing residences. Trees observed within the project area are presumed to be from an agricultural seed source, and are, therefore, not considered to be of special-status.

Animal Taxa of Concern

A number of animal taxa recognized as "special animals" by the CNDDB have been recorded from or are suspected to occur in southeastern Contra Costa County and northeastern Alameda County. "Special animals" is a broad term referring to those animal species with legal status, or considered significant because of restricted distribution, declining habitat and other factors. Table 4.4-3 provides a list of special animals known or suspected to possibly occur in the project area, together with information on their status and preferred habitat characteristics.

Of the 30 animal taxa listed in Table 4.4-3, individuals or distinct evidence of 14 were observed during the field surveys conducted by the applicant's biologist. This included essential breeding or nesting habitat for five species; populations of California red-legged frog and western pond turtle, and breeding pairs of golden eagle, northern harrier and black-shouldered kite. Individuals or evidence of foraging use by burrowing owl, loggerhead shrike, horned lark, yellow warbler, tricolored blackbird and American badger were also observed during the surveys, but no essential breeding or denning habitat was detected. Suitable habitat for longhorn fairy shrimp, vernal pool fairy shrimp and California linderiella is absent from the project area. No evidence of occurrence for the other 16 special-status taxa was encountered during the surveys, including San Joaquin kit fox, other amphibians taxa and insect taxa of concern. The following summarizes information on status, survey methods and conclusions regarding occurrence of taxa of concern in the project area.

Amphibians. Surveys for amphibian taxa of concern were conducted in April, May and June of 1992 (The Habitat Restoration Group and Sycamore Associates, 1992), and in March, April and May of 1993 (Sycamore Associates, 1993). Nine stock ponds and suitable aquatic habitat in portions of Tassajara and Alamo creeks were sampled by dipnet or seine netting in 1992. A total of 16 locations were sampled using similar methods in 1993. The occurrence of western pond turtle and other wildlife species of concern were also noted during the field surveys.

As indicated in Figure 4.4-2, adult and/or larval young of California red-legged frog were observed at seven locations in the project area, and have been recorded from adjacent areas. This frog has recently

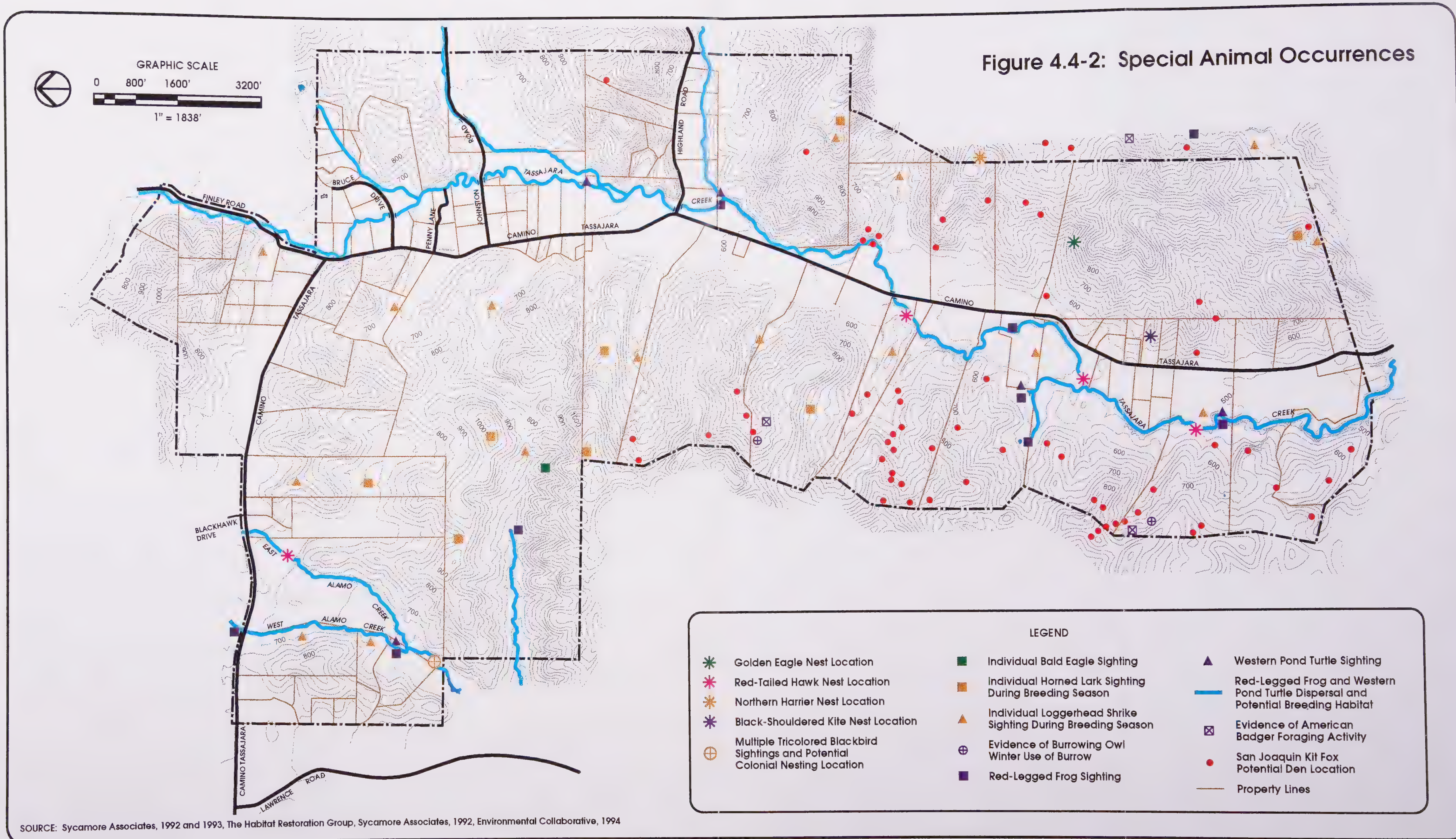

Figure 4.4-2: Special Animal Occurrences

SOURCE: Sycamore Associates, 1992 and 1993, The Habitat Restoration Group, Sycamore Associates, 1992, Environmental Collaborative, 1994

San Joaquin Kit Fox. It appears that kit fox historically inhabited most of the alkali sink community of the San Joaquin Valley and adjacent valley systems (Morrell, 1972, 1975). The kit fox also occupied the lower reaches of many of the surrounding foothill grasslands, extending into western San Joaquin and eastern Contra Costa and Alameda counties. However, intensive agricultural development, livestock grazing and ground squirrel eradication through the use of poison, have greatly reduced the extent of suitable habitat for this subspecies during the past half century. Other factors that may affect kit fox populations include illegal shooting and trapping, road kills, lack of adequate denning sites and interspecific competition with and predation by coyote and red fox. Currently, kit fox occur in the remaining alkali scrub and grassland habitat, with sporadic occurrences in savanna, woodland and suitable agricultural habitat.

Eastern Contra Costa County currently represents the northern-most extent of the known range of the San Joaquin kit fox. Kit fox have been reported from a number of locations in the project vicinity. These include: a 1989 observation 1.0 mile west of the project area along Dougherty Road approximately 1.0 mile south of Crow Canyon Road; various sightings in the Mt. Diablo area to the northeast; a 1989 observation 5.0 miles to the north near Marsh Creek; a 1978 observation 3.9 miles to the northeast at Marsh Creek Road and Camino Pablo; and four sightings in 1988-89 (including a natal den) approximately 6.0 miles to the east near Vasco Road (Simons, 1992, cited in The Habitat Restoration Group, and Sycamore Associates, 1992). The CNDDB records indicate a kit fox den was reported in 1975 from Doolan Canyon, located approximately two miles southeast of the project area. More recent surveys for the species conducted for the Dougherty Valley General Plan Amendment (WESCO, 1991a and 1991b), the Stonechase Development (Harding Lawson Associates, 1990), and Dublin Ranch (H.T. Harvey & Associates, 1991) have failed to document the presence of San Joaquin kit fox.

The applicant's biologist conducted a systematic survey in 1992 to determine whether kit fox are present within the project area. The intensity, duration and methodology of the survey followed standard methodology developed by Region 4 of the CDFG at the time, and was found acceptable by representatives of the USFWS with an additional provision that scat be collected around potential dens in the event that further analysis was desired in the future (USFWS, 1992). This included diurnal transect surveys on all areas of potential habitat, track stations, spotlighting, and camera monitoring.

No direct observations were made or other evidence collected indicating any kit fox use of the project area during the survey effort. Seventy-seven potential kit fox dens[5] were identified during transect surveys (partially mapped in Figure 4.4-2), and unidentified canid scat was collected at six of these potential dens. The survey report by the applicant's biologist concludes that this subspecies' absence from the project area cannot be conclusively determined because of the area's continuity with occupied

[5] As defined by the USFWS, potential dens include any natural den or burrow within the species range that has entrances of appropriate dimensions to accommodate San Joaquin kit foxes for which, however, there is little to no evidence of kit fox use. Potential dens shall include the following features: 1) any suitable unused den; 2) any den or burrow of another species (e.g., ground squirrel) that otherwise has appropriate characteristics for kit fox use; 3) any suitable den for which evidence, in the judgement of a qualified biologist, is insufficient to conclude that it is or has been used by kit fox.

habitat to the east, presence of potential dens and prey base, and the difficulty of detecting kit fox in the northern portion of their range. However, the project area appears to provide only marginally suitable habitat for the fox (The Habitat Restoration Group, 1992; Sycamore Associates, 1992).

In April of 1993, the USFWS issued new protocol for San Joaquin kit fox surveys in the northern part of their range (USFWS, 1993). The kit fox survey by the applicant's biologist was conducted consistent with general methodology specified in 1992 by the CDFG and USFWS. However, the duration of the various surveys no longer meets the new USFWS protocol requirements. The new protocol specify that the spotlight, track station and camera monitoring be conducted over 10 consecutive nights, rather than the six nights performed as part of the survey for the project area. The new protocol states that the 10 night surveys must be conducted on two separate occasions at least 60 days apart, unless otherwise authorized in writing by the Service rather than the single survey period in June of 1992. Attempts during preparation of this Draft EIR to have representatives of the USFWS review the survey report for adequacy were unsuccessful. Earlier correspondence from the USFWS indicates that the survey methodology was acceptable to determine presence of kit fox in the project area (USFWS, 1992).

American Badger. This large mammal occurs in grassland and savanna habitat with an abundant supply of prey. Badgers excavate burrows for denning, and to extract ground squirrels, gophers and other prey. This species has declined or been eliminated from large areas of the state due to agriculture and urban development, and have been designated a Species of Special Concern by the CDFG. Badgers were observed at Camp Parks during surveys in 1990 (WESCO, 1991), and a den was reportedly observed immediately west of the project area in 1992 on the adjacent Dougherty Valley property (Foreman, The Habitat Restoration Group, 1992; Sycamore Associates, 1992).

The open grasslands and savanna habitat in the project area provide high quality foraging habitat for badger where ground squirrels are abundant. Badger diggings were observed at three locations within or adjacent to the project area during the field surveys, as indicated in Figure 4.4-2. All were located within ground squirrel colonies. Large expanses of grassland on hillside slopes and across the valley floors in the project area permit dispersal between the eastern, western, and northern hills along the edge of the project area. Although no dens were observed during the surveys, the project area could be used for denning in the future, particularly along the western or eastern boundaries where human disturbance is minimal (The Habitat Restoration Group, 1992; Sycamore Associates, 1992).

Golden Eagle. This raptor requires extensive areas of open grasslands as territory for feeding and nesting. Nests are built on cliffs or in trees, preferably overlooking grasslands. Some nesting pairs will often use the same nest each year, while others move between alternative nest locations within their territory. In California, the breeding season for golden eagles extends from December through July. Golden eagles are sensitive to disturbance, particularly at nest locations. This species has been designated as a Species of Special Concern by the CDFG because of habitat loss, harassment and sensitivity to disturbance by humans, and declines in prey species abundance.

During surveys conducted by the applicant's biologist and during preparation of this Draft EIR, adult and immature golden eagles were observed on numerous occasions foraging throughout the grasslands and oak savanna. The open grasslands of the project area provide good to moderate quality foraging habitat, limited in some areas by low ground squirrel populations and rural residential development.

Golden eagles have nested within the project area in a small grove of oak trees on the east side of Tassajara Valley on the Moeller property, identified in Figure 4.4-2. A pair attempted to nest at this locations during the 1992 breeding season, but were unsuccessful in hatching any young (Sycamore Associates, 1992a).

Burrowing Owl. This owl has no legal status under the federal or state Endangered Species Acts, but is protected under the provisions of the Migratory Bird Treaty Act and is recognized as a Species of Special Concern by the CDFG, like many of the raptors known to occur in the project area. Evidence of burrowing owl wintering use was observed near the entrances to two burrows in the upper elevations of the western edge of the project area during field surveys. No known colonies or breeding pairs have been reported from the project area, although suitable habitat occurs throughout the valley and could be used in the future. Destruction of California ground squirrel colonies, conversion of pastureland to agricultural and urban development, poisoning and human disturbance have been the major reasons for the decline of this species.

Other Bird Taxa of Concern. Suitable breeding and foraging habitat for several other bird species of concern occurs in the project area, including northern harrier, black-shouldered kite, loggerhead shrike, horned lark and yellow warbler. As shown in Figure 4.4-2, northern harrier and black-tailed kite nests were located during field surveys. Active nests of these and other raptors, including red-tailed hawk, are protected under the Migratory Bird Treaty Act and Section 3503.5 of the State Fish and Game Code.

The freshwater marsh along the lower stretch of Alamo Creek provides suitable breeding habitat for the colonial nesting tricolored blackbird (see Figure 4.4-2). No nesting activity was observed in the project area during the field surveys conducted in 1992, but this does not preclude use of the suitable habitat on Alamo Creek and limited areas of cattail marsh along the southern half of Tassajara Creek in the future.

The willow riparian habitat along Tassajara Creek provides suitable breeding habitat for yellow warbler. Warblers occur in other wooded habitat during migration and winter months, but are more common in riparian habitat. No detailed surveys for yellow warbler were conducted by the applicant's biologist, although small numbers are expected to forage in the wooded habitats in the project area during the spring and fall migration, and possibly as an uncommon breeding species as well. One singing male was observed in unsuitable nesting habitat during the field surveys.

The project area provides foraging habitat for a number of other raptors of concern, including ferruginous hawk, merlin, prairie falcon, peregrine falcon and bald eagle. Suitable nesting habitat for resident prairie falcon and peregrine falcon is absent from the project area. Ferruginous hawk, merlin and bald eagle are most likely winter migrants and uncommon aerial transients that may forage and roost in the project area, but essential habitat for these species is absent.

Insects. Detailed surveys were conducted to determine whether suitable habitat within the project area supported three insect taxa of concern; curved-foot *Hygrotus* diving beetle, Ricksecker's water scavenger beetle and San Francisco forktail damselfly. Three, two-day site visits were conducted by the applicant's consulting entomologist during early March, mid-April and mid-May of 1994. Dip and

drag net samples were made in suitable aquatic habitat throughout portions of the project area where access was permitted. No insect taxa of concern were observed during the survey effort, or are believed to occur in the project area (Entomological Consulting Services, 1994).

Bats. No detailed surveys were conducted for bat taxa of concern, but no indication of essential roosting habitat was encountered during the field surveys. The barns, abandoned buildings and outbuildings which were considered to be potentially suitable habitat for Townsend western big-eared bat and pallid bat are frequented too often by humans to be used as maternal roosts for these sensitive species. Suitable roosting habitat for California mastiff bat is absent within the project area. Oak trees and snags with large cavities could serve as roosts for pallid bat, but further detailed surveys should only be required if tree and snag removal is proposed as part of a specific development plan.

Wetlands

Although definitions vary to some degree, wetlands are generally considered to be areas that are periodically or permanently inundated by surface or ground water, and support vegetation adapted to life in saturated soil. Wetlands are recognized as important features on a regional and national level due to their high inherent value to fish and wildlife, use as storage areas for storm and flood waters, and water recharge, filtration and purification functions. Jurisdictional "waters of the United States," including wetlands, are regulated by the Corps under Section 404 of the Clean Water Act, which considers applications for permits for discharge of dredge or fill material. Wetlands associated with creeks, ponds and other water features with a defined bank and bottom are also regulated indirectly by the CDFG under Section 1601-1606 of the Fish and Game Code of California as part of the Streambed Alteration Agreement process.

To determine the extent of jurisdictional wetlands on the site, a preliminary wetland delineation was conducted by the applicant's biologist (Sycamore Associates, 1992a). The wetland delineation was conducted using methods established by the Corps, and submitted for verification. Following review and field inspections in October 1992, refinement of mapping by Sycamore Associates, and a supplemental inspection in September 1993, the Corps verified the extent of jurisdictional wetlands on portions of the project area where access was permitted (Corps, 1994). Based on the confirmed estimates, areas which fall under Corps jurisdiction encompass approximately 14.12 acres. Figure 4.4-3 shows the location of mapped wetlands or waters of the United States, and limitations on field verification by the Corps. Table 4.4-4 provides a summary of the verified jurisdictional areas.

As indicated in Figure 4.4-3, jurisdictional waters and wetlands have not been mapped or verified for a large portion of the project area. This includes: major segments of Tassajara Creek from the Finley Road intersection to south of Highland Road, and again south of the Tassajara Road crossing; tributaries to Tassajara Creek in the Johnston Road area indicated as intermittent blue-line streams on the USGS topographic map of the area; and stock ponds and a seasonal drainage which is also mapped as an intermittent blue-line stream on the Rapp property west of Tassajara Creek. California red-legged frog has been observed in alternate years on both the ponds on the Rapp property during the amphibian surveys conducted by the applicant's biologist, indicating the possible importance of unverified jurisdictional wetlands and other waters in the project area.

TABLE 4.4-4
SUMMARY OF JURISDICTIONAL WETLANDS AND WATERS OF THE U.S.

Wetland Habitat Type	Area (acres)
Mixed riparian forest	1.08
Willow scrub	0.33
Valley oak riparian woodland	0.05
Freshwater marsh	3.17
Freshwater seep	0.36
Alkali seep	0.51
Valley wildrye grassland	0.10
Seasonal wetlands	5.33
Pond	0.32
Total Verified Wetlands	11.25
Total Verified Other Waters of the U.S.	2.87
Total Verified Jurisdictional Waters and Wetlands	14.12

Note: Acreages for wetland habitat types vary to some degree from those indicated in Table 4.4-1 due to presence of riparian habitat located above high water and outside Corps jurisdiction, refinement of mapping in some locations, and to limited verification by the Corps because of restricted access on some properties.

Source: Sycamore Associates, 1992c.

Relationship to County General Plan

A number of the goals, policies, and implementation measures contained in the Conservation Element of the *Contra Costa County General Plan* (Contra Costa County, 1996) relate to the importance of protecting and enhancing important vegetation and wildlife resources, including riparian zones, wetlands, mature trees and special-status taxa. These relevant aspects of the *General Plan* are listed below, numbered as they are in the Conservation Element.

<u>Vegetation and Wildlife Goals</u>

8-D. To protect ecologically significant lands, wetlands, plant and wildlife habitats.

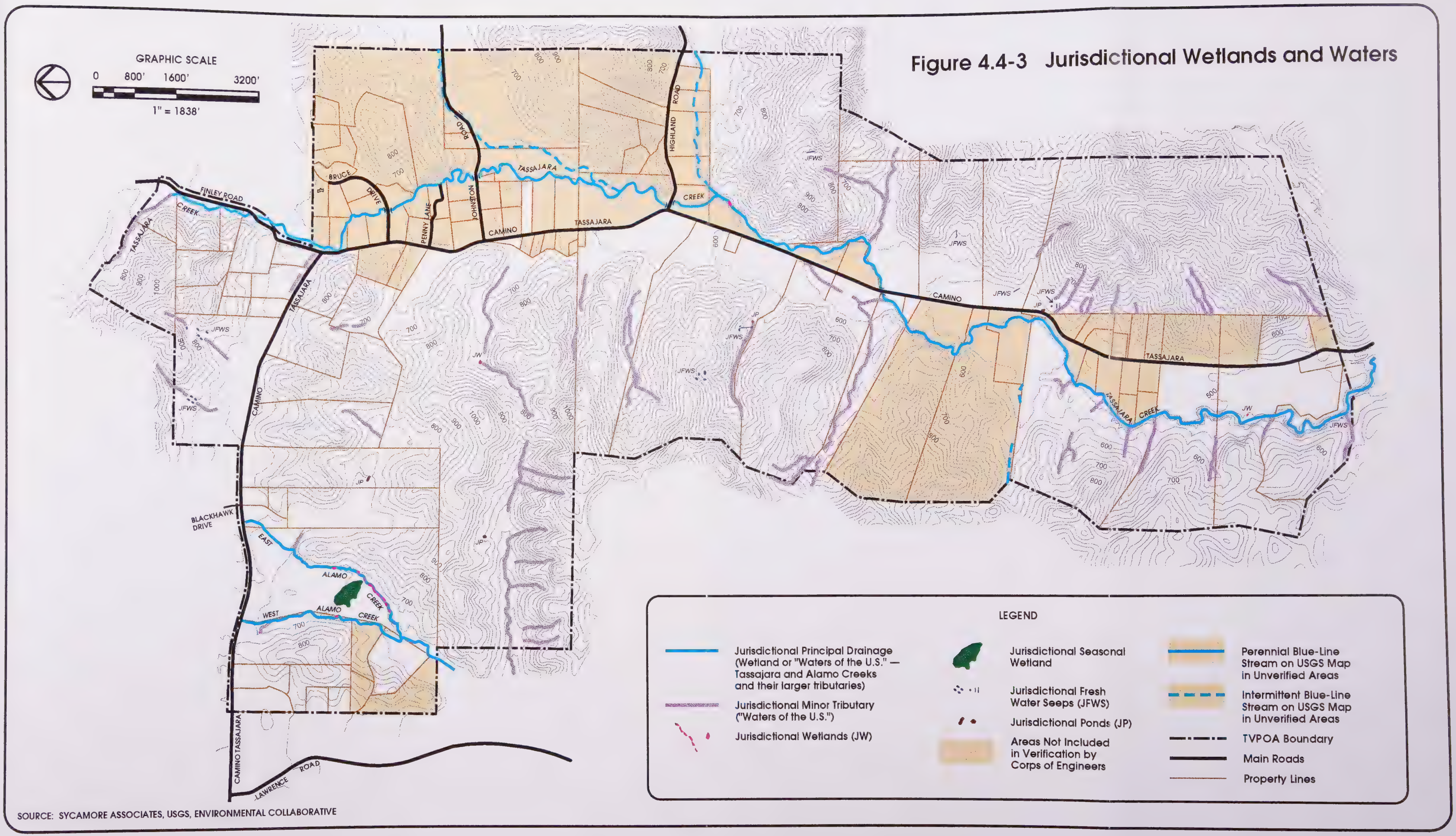
Figure 4.4-3 Jurisdictional Wetlands and Waters
GRAPHIC SCALE
0 800' 1600' 3200'
1" = 1838'
LEGEND
Jurisdictional Principal Drainage (Wetland or "Waters of the U.S." — Tassajara and Alamo Creeks and their larger tributaries)
Jurisdictional Minor Tributary ("Waters of the U.S.")
Jurisdictional Wetlands (JW)
Jurisdictional Seasonal Wetland
Jurisdictional Fresh Water Seeps (JFWS)
Jurisdictional Ponds (JP)
Areas Not Included in Verification by Corps of Engineers
Perennial Blue-Line Stream on USGS Map in Unverified Areas
Intermittent Blue-Line Stream on USGS Map in Unverified Areas
TVPOA Boundary
Main Roads
Property Lines
FINLEY ROAD
TASSAJARA CREEK
CAMINO TASSAJARA
BRUCE DRIVE
PENNY LANE
JOHNSTON ROAD
HIGHLAND ROAD
BLACKHAWK DRIVE
EAST ALAMO CREEK
WEST ALAMO CREEK
LAWRENCE ROAD
SOURCE: SYCAMORE ASSOCIATES, USGS, ENVIRONMENTAL COLLABORATIVE

Vegetation and Wildlife Policies

8-6. Significant trees, natural vegetation, and wildlife populations generally shall be preserved.

8-7. Important wildlife habitats which would be disturbed by major development shall be preserved, and corridors for wildlife migration between undeveloped areas shall be retained.

8-12. Natural woodlands shall be preserved to the maximum extent possible in the course of land development.

8-13. The critical ecological and scenic characteristics of rangelands, woodlands, and wildlands shall be recognized and protected.

8-14. Development on hillsides shall be limited to maintain valuable natural vegetation, especially forests and open grasslands, and to control erosion. Development on open hillsides and significant ridgelines throughout the County shall be restricted, and hillsides with a grade of 26 percent or greater shall be protected through implementing zoning measures and other appropriate actions.

8-15. Existing vegetation, both native and nonnative, and wildlife habitat areas shall be retained in the major open space areas sufficient for the maintenance of a healthy balance of wildlife populations.

8-17. The ecological value of wetland areas, especially the salt marshes and tidelands of the bay and delta, shall be recognized. Existing wetlands in the County shall be identified and regulated. Restoration of degraded wetland areas shall be encouraged and supported whenever possible.

8-21. The planting of native trees and shrubs shall be encouraged in order to preserve the visual integrity of the landscape, provide habitat conditions suitable for native wildlife, and ensure that a maximum number and variety of well-adapted plants are sustained in urban areas.

8-22. Applications of toxic pesticides and herbicides shall be kept at a minimum and applied in accordance with the strictest standards designed to conserve all the living resources of the County. The use of biological and other non-toxic controls shall be encouraged.

8-23. Runoff of pollutants and siltation into marsh and wetland areas from outfalls serving nearby urban development shall be discouraged. Where permitted, development plans shall be designed in such a manner that no such pollutants and siltation will significantly adversely affect the value or function of wetlands. In addition, berms, gutters, or other structures should be required at the outer boundary of the buffer zones to divert runoff to sewer systems for transport out of the area.

8-27. Seasonal wetlands in grassland areas of the County shall be identified and protected.

- a substantial reduction in habitat for fish, wildlife or plants. Aspects of the proposed *General Plan* Amendment and *Preliminary Development Plan* which would result in substantial conflicts with the goals and policies of the County *General Plan*.

Although not specifically identified in the CEQA Guidelines as a potentially significant impact, modifications to wetlands are of great concern to jurisdictional agencies due to the regional and national importance of these features. The cumulative adverse effect of seemingly minor changes to wetlands can often result in major damage to these resources through numerous individual alterations. Loss or substantial modification to existing wetlands would, therefore, also be considered a potentially significant effect.

All impacts are considered significant adverse impacts unless identified otherwise. The corresponding mitigation measure(s), unless otherwise noted, would be sufficient to reduce impacts to a less-than-significant level. Although not required by CEQA, some less-than-significant impacts have been discussed because they are issues of local concern. While no mitigation measures are required by CEQA for less-than-significant impacts, in some cases recommendations are proposed that could be considered by staff as conditions of project approval.

Figure 4.4-4 provides a key to the areas described in the following text, as well as illustrates various mitigation measure recommended below.

Impact 4.4-1 A substantial acreage of non-native grassland plant community would be eliminated by grading and replaced by suburban development.

Over 1,030 acres (excluding Wendt Ranch) of existing vegetative cover would be removed to accommodate proposed development throughout valley bottoms, lower hillside slopes and some spur ridges. Additional cover in proposed open space, parks and recreational use areas would be eliminated through installation of native tree and shrub plantings, turf and ornamental landscaping, water tanks, maintenance and access roads, parking areas, trails and other improvements. Most of the affected vegetation would consist of non-native grassland and dryland agricultural crops, with only limited disturbance to riparian vegetation, oak woodlands and mature oaks. However, even the annual grasslands are an important resource because of their value to wildlife.

As indicated by the extent of anticipated grading shown in Figure 4.4-1, extensive grading and grassland habitat loss would occur throughout Areas A, B, C, D, F, and K (Figure 4.4-4), with sensitive habitat protected along creek corridors and most locations with well-developed woodland. Grading would occur on the valley bottom and some hillside locations in Areas L, G, I, and J (Figure 4.4-4). Limited grading would occur in Areas E and H (Figure 4.4-4), primarily to accommodate driveways and low density single-family residential development (refer to Figure 4.4-1).

The *Design Guidelines* address retention and management of the annual grasslands, and concludes that restoration of native perennial grasses requires intensive management and should be limited to the roughs and open areas of the proposed golf course. An important aspect of re-establishing annual grassland cover on graded slopes is re-seeding, which is routinely done to control erosion and has not

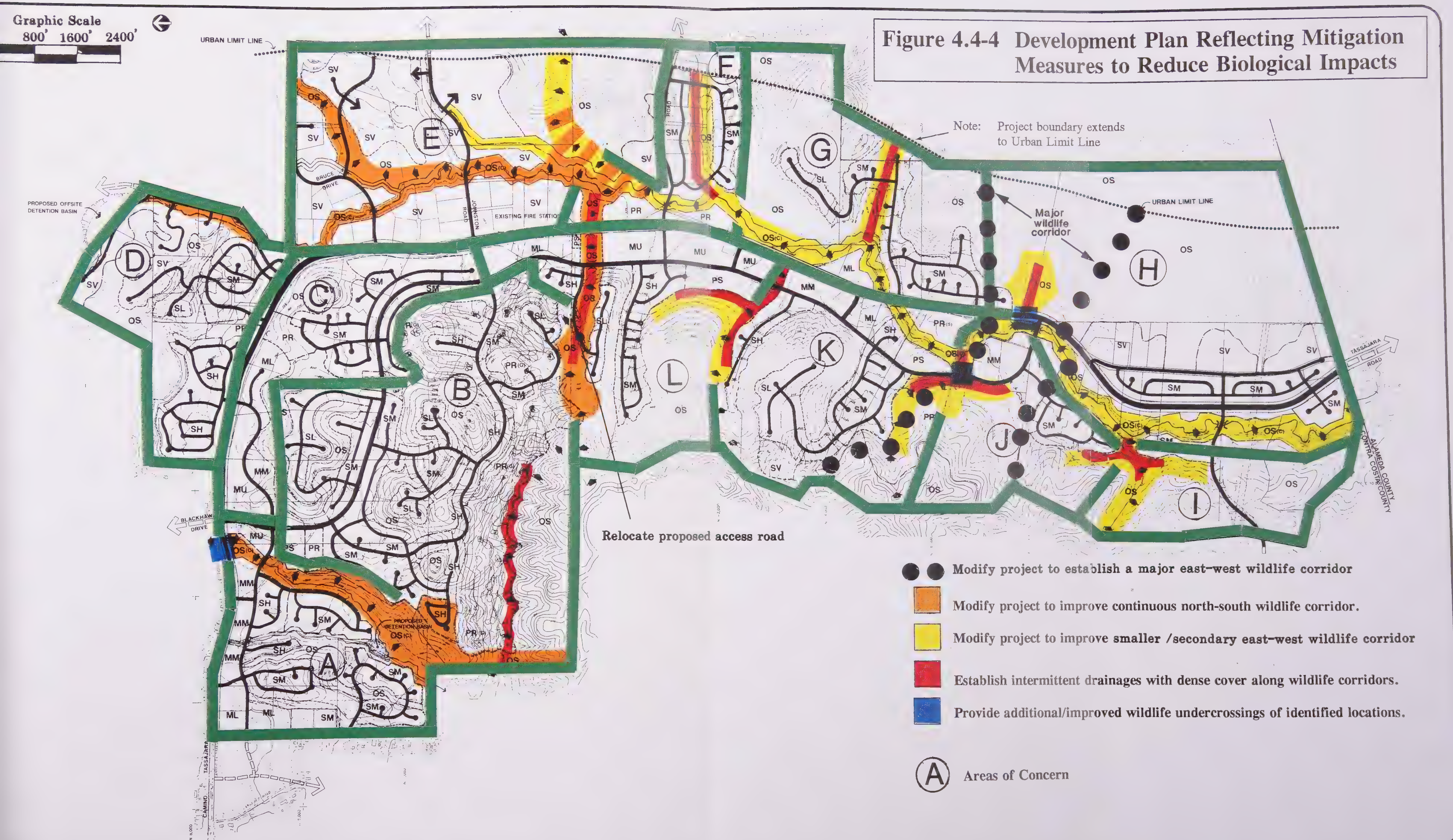

Figure 4.4-4 Development Plan Reflecting Mitigation Measures to Reduce Biological Impacts

Source: Environmental Collaborative

been addressed in detail in the *Design Guidelines*. The limits of grading indicated in the proposed Grading Plan generally encompass the narrow belts of open space separating different development areas, and also extends into the periphery of grasslands in the larger tracks of open space. Once grading has been completed, these disturbed open space areas would presumably be reseeded to re-establish grassland cover. Using a mixture of compatible native and non-native perennial and annual species would serve to enhance the diversity of the grasslands, which can often be limited to one or two highly invasive, non-native annuals. *General Plan* Policies 8-14 and 8-15 both pertain to maintaining existing vegetative cover, including open grasslands, to control erosion and maintain wildlife habitat. Modifications to provisions in the *Design Guidelines* would be necessary to comply with these policies and provide for protection and re-establishment of grassland habitat.

Improved access to the hillsides of the project area could result in off-road vehicle activity through undeveloped land and designated open space, particularly during the construction phase of specific developments. Off-road vehicle activity could result in further damage to grassland and other vegetative cover, disturbance to sensitive wildlife features, and may contribute to erosion of hillside areas and sedimentation in creeks unless adequate measures are taken to prevent unauthorized vehicle access.

Landscaping throughout developed areas would likely be composed of both non-native and native species used in ornamental plantings, including a variety of trees, shrubs and groundcovers. Non-native ornamentals may compete with native species in open space areas, particularly if highly aggressive species such as eucalyptus and acacia are planted near the interface with undeveloped hillsides and along riparian corridors. The appendix to the *Design Guidelines* includes a table that identifies undesirable plant species which should not be planted directly adjacent to open space, but no specific measures have been included in the Open Space and Natural Resources chapter of the report referring reviewers to the table and need to comply with the planting restrictions.

The potential conversion of over 1,000 acres of grasslands to suburban development represents a substantial reduction of this natural plant community, and together with the potential for additional damage by off-road vehicle activity, replacement with highly invasive species, and loss of associated wildlife habitat value would be considered a significant impact.

Mitigation Measures

All of the following mitigation measures are required to reduce impacts on the grassland community to a less-than-significant level.

4.4-1(a) *Specific development plans within the project area must be reviewed and, as necessary, modified to comply with the Open Space and Natural Resource provisions of the final "Tassajara Design Guidelines," ensuring protection of sensitive biological resources, replacement and enhancement of wetlands and degraded habitat, and long-term management of open space areas.*

4.4-1(b) *The appendix to the proposed "Tassajara Design Guidelines" should be expanded to include a potential seed mix list of compatible grasses and forbs suitable for reseeding graded slopes throughout the project area. The list should include both native and common non-native perennial and annuals. Relative quantities of each species should be specified for application on a per acre basis.*

4.4-1(c) *The Open Space Management and Maintenance provisions under Restoration and Management on page 100 of the proposed "Tassajara Design Guidelines" should be revised to include the following additional measures:*

- *Vehicles and motorcycles must not be allowed to travel off designated roadways to minimize future disturbance to grassland cover and other vegetation, and unauthorized access to the surrounding undeveloped lands and open space.*

- *Graded slopes in open space areas must be reseeded with a mixture of compatible native and non-native perennial and annual species to increase the diversity of the grassland cover. Highly invasive annuals typically used for erosion control alone should not be used. Suitable species and an appropriate seed mix for revegetation of graded slopes is listed in the appendix of the "Tassajara Design Guidelines."*

4.4-1(d) *The measure regarding use of turf and ornamental species under Restoration and Management on page 100 of the proposed "Tassajara Design Guidelines" should be revised to read as follows:*

- *Turf and ornamental landscapes should be restricted or prohibited in open space areas. Restrictions on unsuitable landscape species identified in the "Tassajara Design Guidelines" Appendix should be carefully reviewed and enforced. Cut and fill slopes should be revegetated with a mixture of compatible native and non-native perennial and annual species.*

4.4-1(e) *The measure regarding seeding of graded slopes under Erosion Control and Channel Stability on page 111 of the proposed "Tassajara Design Guidelines" should be revised to read as follows:*

- *Revegetate graded slopes with a mixture of compatible native and non-native perennial and annual species. Highly invasive annuals typically used for erosion control alone should not be used. Suitable species and an appropriate seed mix for revegetation of graded slopes is listed in the "Tassajara Design Guidelines" Appendix.*

Impact 4.4-2 Development as proposed would require removal of mature oaks and other native trees in areas of oak woodland, savanna and riparian forest communities.

The *Preliminary Development Plan* (1995) generally avoids direct removal of most mature native trees by establishing open space designations along the Tassajara Creek corridor and areas of well-developed oak woodland. Some tree removal would still occur to accommodate roadways, creek crossings and residential and golf course development in portions of the project area. As indicated in Figure 4.4-1, anticipated grading encompasses the fringe of several areas of oak woodland and savanna, which would require removal of approximately 55 mature native trees. This would include: loss of an estimated 18 scattered trees in Area B; loss of an estimated nine trees in Area L; loss of seven trees in Area K; loss of an estimated eight trees in Area G, including five trees on the edge of the woodland northwest of the development area; and loss of an estimated 10 trees in Areas C and D (Figure 4.4-4). Although most trees within the project area would be preserved in open space areas and only a small percentage would be removed to accommodate development, further modifications to individual development plans would serve to protect clusters and isolated specimen trees, providing greater consistency with *General Plan* Policies 8-12, 8-13, 8-28, and 8-89.

The *Design Guidelines* include detailed measures which call for protection of mature, native specimen trees. Further refinement of grading and other improvement plans during review of specific development plans in the project area would provide a more accurate determination of the actual number of trees to be removed, and opportunities to modify plans to preserve individual trees to the maximum extent possible. While measures are included to minimize the potential for damage from construction, irrigation and other modifications in the vicinity of trees to be retained, the *Design Guidelines* do not define a clear procedure to accurately identify tree trunk locations and consider them during refinement of specific development plans, which is necessary to prevent removal to the degree possible. Where tree removal is unavoidable, replacement plantings are recommended at a ratio of 3:1 (three established replacement trees for each tree removed), consistent with *General Plan* Policy 8-21.

Trees not directly removed by grading or other improvements may be damaged or adversely affected during construction or as a result of long-term changes to drainage patterns, irrigation and other factors. Mature oaks and other trees are sensitive to changes in drainage patterns, soil compaction, trenching, landscape irrigation and other modifications within the root zone. Considerable care is necessary to protect trees in the vicinity of grading, building and roadway construction, and landscape improvements. Wounding of trunks and major roots during construction is a common problem, which results in the invasion of harmful organisms and can contribute to structural decay of the tree. Root loss and a reduction in potential rooting area often contributes to long-term tree decline. In general, any disturbance within the dripline should be avoided to prevent adverse changes which may affect the long-term health and condition of trees to be preserved. Monitoring by a certified arborist would serve to ensure that vulnerable trees are treated appropriately during construction.

The proposed *Design Guidelines* provide detailed measures to prevent construction-related damage and minimize the potential for inappropriate management of trees to be preserved. These measures include necessary construction restrictions and a listing of suitable plantings in the vicinity of oaks, but do not

recommend monitoring by a certified arborist. In addition, the "Oak Intrusion Tree List" in the appendix to the *Design Guidelines* lists species to be planted along roadways where existing oak woodland remains, but several are not native to the project area and would be unsuitable.

Although the *Design Guidelines* provide detailed measures for protection of specimen trees and other oaks, implementation of the proposed *Preliminary Development Plan* and the Grading Plan without more detailed tree mapping and plan refinement could result in the loss of a substantial number of mature oaks, which would be considered a significant impact.

Mitigation Measures

All of the following mitigation measures are required to reduce impacts on sensitive natural communities and mature trees to a less-than-significant level.

4.4-2(a) *Consistent with recommendations in the proposed "Tassajara Design Guidelines," mature oaks and other native trees in the project area should be preserved and protected to the maximum extent possible. Specific development plans within the project area should be reviewed, and as necessary modified to ensure compliance with the tree protection and oak woodlands provisions in the final "Tassajara Design Guidelines."*

4.4-2(b) *The proposed Preliminary Development Plan, Grading Plan and other project plans should be revised as follows to preserve and protect mature native trees.*

- *Eliminate a portion of the proposed Low Density Single-Family Residential area in Area G (Figure 4.4-4) to preserve the fringe of the oak woodland on the northwest-facing slope east of Tassajara Creek. Grading and proposed development should be restricted to the east of the southeast-trending spur ridge that supports the woodland.*

- *Refine anticipated grading in the proposed Low Density Single-Family Residential area in Area D (Figure 4.4-4) to preserve individual trees on the north and east-facing slopes which could be removed to accommodate roadway access and ridgetop development in this location.*

- *Relocate golf course improvements in Area B (Figure 4.4-4) to provide greater protection of individual oaks below the proposed Club House, and the lower elevations of the major oak woodland in this location. Grading should be restricted away from individual trees and the fringe of the woodland.*

4.4-2(c) *The Protection of Specimen Trees provisions on page 99 of the proposed "Tassajara Design Guidelines" should be revised to include the following additional measures:*

- *Tree trunk locations should be accurately surveyed within 100 feet of proposed development areas, and trunk and canopy locations should be considered during preparation of specific development plans.*

- *Proposed grading, roadway, creek crossings, drainage and lot improvements should be designed to minimize tree removal, and specific development plans modified accordingly.*

- *Monitoring should be provided by a certified arborist during all phases of construction to ensure adverse impacts to trees to be retained are minimized and any necessary corrective measures are taken to repair possible damage.*

- *An arborist should be retained for the supervision of any required trimming, clearance pruning, installation of protective fencing, mulching, root and trunk preservation, and incursions within root protection zones.*

4.4-2(d) *The Oak Intrusion Tree List in the appendix to the proposed "Tassajara Design Guidelines" should encourage the use of native species. Holly oak, cork oak and southern live oak are not native to California and should be removed from the list, which is intended to provide suitable plantings where roadways pass by existing oak woodlands. The list should also be revised to apply to plantings along riparian forest, where roadways cross or parallel the edge of established oak and other tree cover along Tassajara Creek.*

Impact 4.4-3 Wildlife habitat would be altered and fragmented, and wildlife use disrupted.

The proposed project would alter the existing patterns of wildlife use, replacing substantial areas of primarily grassland habitat with development on approximately 50 percent of the project area, and disrupting movement patterns of larger terrestrial species. Smaller resident mammals, amphibians and reptiles would be eliminated from areas encompassed by development, and birds and larger mammals would be at least temporarily displaced to adjacent areas as specific development plans are implemented. Species that are highly sensitive to human activity and disturbance, particularly predatory mammals and birds, may be eliminated from all or large portions of the project area, with the undeveloped lands along the western and eastern edges providing only fragmented habitat.

Following construction and establishment of landscape improvements, developed portions of the project area would probably continue to be frequented by wildlife common to suburban areas, such as raccoon, opossum, Norway rat, house sparrow and house finch, particularly as landscaping matures and provides protective cover and nesting substrate. Deer would likely continue to forage along the fringe of development in open space areas, and may eventually become a nuisance to future residents, damaging ornamental landscaping and young native plantings.

While most of the established riparian corridors and woodland cover would be preserved in open space areas, much of the grassland habitat on lower elevations and in some instances along spur ridges and edges of the project area would be lost. The direct loss of stockponds, seeps, and access to creeks and other wetland features, all providing an important sources of water for wildlife, could substantially reduce wildlife use in this arid region. Access to the two main creeks along the valley floors would generally be limited to narrow bands of upland open space between dense residential and commercial development. The recently approved Wendt Ranch project will substantially alter the viability of the Alamo Creek as a wildlife movement corridor, establishing high-density development on both sides of both branches, which narrows to less than 100 feet at the northeastern edge of the site. In addition, movement along the Alamo Creek corridor is currently constrained by a grate and concrete drop structure in the culvert undercrossing of Camino Tassajara, which effectively precludes use of what could be an essential link between the Black Hills to the north and Dougherty Valley to the south. Rural residences border both sides of Alamo Creek at the southern end of Lawrence Road before the creek continues southwest into the undeveloped Dougherty Valley area. The undeveloped hillside slopes along the western edge of the project area are most likely an essential link for wildlife movement along this segment of the Alamo Creek corridor. Approved and proposed development would reduce this link to a narrow, disrupted band of grassland, bordered by high-density development and golf course improvements. Wildlife movement across the valley floors and between the western, eastern and northern edges of the project area would be substantially reduced for terrestrial species, and the habitat value these areas would otherwise provide would be limited due to fragmentation, conflicting with *General Plan* Policy 8-7.

The *Design Guidelines* include provisions addressing wildlife corridors through the project area, but proposed development and recreational uses along these corridors indicated in the *Preliminary Development Plan* would diminish the effectiveness and functional value of these features. Rather than following seasonal drainages where wildlife movement would generally be expected and opportunities for establishing dense protective cover would be greatest, most of the proposed corridors interface with development on hillside and upland locations where they would be of little value, particularly to larger, more sensitive target species such as deer, fox, badger and mountain lion. These include the proposed corridors in Areas I, J, K, L, and B (Figure 4.4-4). No corridor across Tassajara Road has been proposed to link upland habitat in the Tassajara South or Mid-Valley East communities. This may become an essential link as it provides a direct connection with the southern edge of the Hidden Valley open space and a one-quarter-mile-wide wildlife corridor which was incorporated into the recently approved *Dougherty Valley General Plan* Amendment and Specific Plan Amendment.

At their narrowest locations, the proposed wildlife corridors would be less than 400 feet in width, constricting even further through neighborhood parks and at major roadways where a wildlife undercrossing with a 10-foot diameter is proposed. With the exception of the main creek channels, existing vegetation along all of the other wildlife corridors would be eliminated by proposed grading, requiring re-establishment of wildlife use if these bands of "open space" are to function as movement corridors in the future. Dense vegetation and fencing is proposed in the vicinity of the undercrossing and through neighborhood parks to provide cover and separate wildlife movement from recreation activity and other uses. However, no creek channel or other mechanism to draw wildlife across these upland areas has been proposed. All of the corridors would pass through locations where intensive development and recreational activities would likely preclude use by more sensitive wildlife, and even

more tolerant species could be harassed by children and pets as they attempt to pass across the valley floors. These narrow corridors would provide the only link between the western, eastern and northern edges of the project area and surrounding undeveloped lands.

While the *Design Guidelines* attempt to address the importance of providing for wildlife movement through and across the project area, movement of terrestrial species would be substantially diminished, access to creeks and woodlands would be limited by surrounding development, and habitat in proposed open space area fragmented, which would be considered a significant impact.

The proposed project should be revised to improve the functional value of the proposed wildlife corridors. These revisions should include: 1) providing two major links across the project area, connecting the western edge with the Black Hills to the north and with the Collier Canyon area to the east; 2) increasing the width of the proposed smaller "strip" and "line" corridors across the valley floors and along the edges of the project area; and 3) improving the likelihood of future use of the corridors by requiring that intermittent drainage with natural channel banks and bottoms supporting dense riparian forest and scrub cover be created through developed areas to provide a focus for movement by wildlife.

Mitigation Measures

All of the following mitigation measures are required to reduce impacts on wildlife habitat to a less-than-significant level. (Refer to Figure 4.4-4 for identification of mitigated areas.)

4.4-3(a) *The following revisions should be made to the proposed "Preliminary Development Plan" and associated plans to encourage wildlife movement along wildlife corridors through creation of natural drainages and protective cover:*

- *Revise the grading and drainage plans to create natural, unlined drainage channels along all the proposed wildlife corridors across valley floors and lower elevations of the project area, and direct runoff from developed areas into the channels to provide a source of surface water in these features. These channels should be compatible with geotechnical considerations.*

- *Prepare detailed restoration landscaping plans to provide for establishment of natural cover along the wildlife corridor drainages. Although irrigation may be necessary for the first few years to ensure establishment, vegetation in the drainages should eventually be self-sustaining without irrigation.*

- *Design the wildlife corridor drainages to flow through the proposed wildlife undercrossings of major roadways. All wildlife undercrossings should be oriented perpendicular to the roadways to minimize their length.*

- *Restrict landscaping to use of native species along the wildlife corridor drainages, creating native freshwater marsh and riparian scrub and forest cover along the new channels, bordered by a cover of non-native grassland and oak woodland/savanna plantings.*

- *Implement landscape improvements along each new drainage during the initial phase of a specific development, allowing cover vegetation and wildlife use to become established before buildout of the surrounding area.*

4.4-3(b) *Continuous north-south wildlife corridors should be provided from the undeveloped hills to the north of the project area to the Dougherty Valley to the southwest by improving the proposed wildlife corridors through Areas A, B, D, E, and L (Figure 4.4-4). The proposed Preliminary Development Plan should be revised as follows:*

- *Preserve the link between Dougherty Valley and Alamo Creek through Area B by providing a wildlife corridor designation in the upland ridgeline area between the East Branch of Alamo Creek south of the Wendt Ranch site and the tributary stream through the proposed golf course along the western edge of the project area. This corridor should have a minimum width of 1,100 feet, which would require elimination of the triangular-shaped High Density Single-Family Residential area along the ridgecrest, and replacement of the area as Open Space. Elimination of the residential use in this location should serve to minimize the extent of required grading along the ridgecrest and serve to protect the three mature oaks which would otherwise be removed.*

- *Maintain a functional wildlife movement corridor along the East Branch of Alamo Creek by restricting development a minimum of 50 feet from both sides of the channel bottom.*

- *Continue the wildlife corridor designation along Tassajara Creek through Areas C and D as this corridor provides a crucial link across the valley floor and connection to strip corridors proposed in Areas I, J, K, and L.*

- *Expand the link between Tassajara Creek and Dougherty Valley through Areas L and E by increasing the proposed wildlife corridor to a minimum of 500 feet and limiting roadway crossings to Camino Tassajara and Country Loop Road. The proposed access to the Low Density Single-Family Residential area on the spur ridge to the south of the proposed corridor across Area L should be relocated to the south side of the spur ridge. This should also include relocation of the access to the High Density Single-Family Residential area along the west side Country Loop Road away from the wildlife corridor to the center of the residential use cluster.*

4.4-3(c) *Continuous east-west wildlife corridors should be provided from the undeveloped hills to the east of the project area to the Dougherty Valley to the west by consolidating and expanding the proposed wildlife corridors through Areas I, J, and K (Figure 4.4-4) and extending wildlife corridors into other communities. The proposed Preliminary Development Plan should be revised as follows:*

- *Establish at least one major east-west wildlife corridor with a width of approximately one-quarter mile to provide a major link between the open space lands of Hidden Valley to the west and the undeveloped lands outside the urban limit line to the east. The preferred location of this major corridor should be coordinated with representatives of the USFWS and the CDFG to ensure that potential adverse impacts on special-status species such as San Joaquin kit fox are fully addressed, as recommended in mitigation measure 4.4-4(a). No new development or roadways should be permitted within the major corridor, and a wildlife undercrossing should be provided under Camino Tassajara as part of the corridor improvements. Lands within the corridor should be identified as open space or agricultural use with appropriate restrictions established to prohibit new residences, golf courses, or other development within the corridor. The preferred location of the major corridor appears to be through the center of Area J, along the alignment of the proposed southern terminus of Country Loop Road. Establishing the wildlife corridor at this location would require relocation of the end of Country Loop Road to the north into Area K, and elimination of most of the Medium Multiple Family Residential in Area J. The smaller proposed wildlife corridors between Areas K and J and Areas J and I would no longer be needed if the major corridor is established.*

- *Extend a wildlife corridor into Area H (preferably the major east-west corridor) through construction of a wildlife undercrossing under Camino Tassajara at the seasonal drainage through the northern boundary of the open space on the east side of Camino Tassajara. The drainage should be enhanced with native plantings to provide protective cover between the hillside and the creek and to screen views of the developing valley floor from the sensitive golden eagle nest location.*

- *Establish wildlife corridors along the tributary stream south of Highland Road and on the Brown property in Areas F and G, respectively. Corridors through these two locations should be a minimum of 400 feet in width, and the existing or relocated drainage should be restored with riparian scrub and forest cover. Proposed Medium Density Single-Family Residential use should be eliminated or relocated as necessary to accommodate the corridors through these two locations.*

- *Define uses in the proposed open space area at the southern edge of Area L to include a new wildlife corridor drainage. Recreational uses such as the proposed Trail Staging Area indicated in the Parks & Open Space Diagram should be restricted to one side and a minimum of 50 feet from the channel through the corridor.*

4.4-3(d) *Modifications should be made to the Alamo Creek culvert undercrossing of Camino Tassajara to improve the value of this potentially crucial movement corridor. These improvements should be made during the initial phase of project implementation given*

the significance of this corridor link, and all cost should be provided by TVPOA. These should include the following:

- *Physical improvements should at minimum include removal of the existing grate at the southern opening of the culvert and modifications to the interior of the culvert to provide a more gentle transition over the drop structure at the northern opening which precludes use by smaller mammals.*

- *Interior changes could include construction of a series of small weirs within the culvert which gradually increase to the height of the drop structure, allowing for deposition of gravel/sediment on the bottom of the structure to create a more natural channel bottom.*

  Any proposed changes to the interior of the culvert should be evaluated from a hydrologic standpoint to ensure that peak storm flows would still be accommodated. If necessary, the culvert should be replaced and increased in size to accommodate its dual function for drainage and as a wildlife movement corridor.

- *To the degree possible, improved access and protective cover should be provided around the fringe of the detention basin on the Blackhawk property to the north of the culvert to enhance the overall habitat value of the corridor. These improvements would be dependent on negotiations with representatives of Blackhawk, but preferably should include dense landscaping at the northern entrance to the culvert and creation of an upland passage along the eastern bank of the detention basin which extends to the culvert opening.*

4.4-3(e) *The replacement tributary stream of Alamo Creek through the golf course in Area B should be relocated to the southern edge of the course, adjacent to the existing oak woodland. Restoring the stream at this location would serve to minimize disturbance by humans, avoid the need for long-term suppression of mature trees and shrubs which could otherwise interfere with play on the course, and greatly enhance the value of this feature as a movement corridor and eventually as riparian habitat. Features of the restoration plan include:*

- *Restore and enhance the stream to provide well-developed freshwater marsh, and riparian scrub and forest cover.*

- *Create ponds and pools with dense emergent freshwater marsh cover along the stream to provide replacement dispersal habitat and future breeding habitat for California red-legged frog.*

4.4-3(f) *A replacement tributary stream should be provided between the enhanced pond habitat in the proposed West Community Park and Tassajara Creek in Area J to maintain and enhance the function of this stream as a dispersal corridor for California red-legged*

frog, western pond turtle, and other wildlife. The feasibility of relocating the stream corridor within the recommended wildlife corridor along the western edge of Country Loop Road should be explored (see Figure 4.4-4). This may require adjustment to the proposed alignment of Country Loop Road to accommodate a stream channel between the roadway and hillside slope to the west. Adjustment of the roadway alignment would require eliminating a portion of the Medium Density Single-Family Residential designation along the eastern edge of the current roadway alignment. Alternatively, the relocated stream segment could pass through the Medium Density Single-Family Residential use area. This would require an open space corridor with a minimum width of 200 feet along the stream alignment and redesignation of this area as Open Space. Features of the restoration plan for the relocated stream segment should include:

- *Restore and enhance the stream segment to provide well-developed freshwater marsh, and riparian scrub and forest cover.*

- *Create ponds and pool habitat with dense emergent freshwater marsh cover along the stream segment between the existing ponds and Tassajara Creek to provide replacement dispersal habitat and protective cover for California red-legged frog and western pond turtle.*

4.4-3(g) *The Wildlife Corridors provisions listed on page 97 of the proposed "Tassajara Design Guidelines" should be revised to include the following additional measures:*

- *Create seasonal drainages with unlined channel banks and bottoms along wildlife corridors through developed areas, providing natural movement corridors with dense protective cover and opportunities to minimize water quality degradation of Alamo and Tassajara creeks through natural filtration which would occur along drainage swales and channels.*

- *Prepare and implement detailed restoration landscaping plans to provide for establishment of natural communities along the recommended drainages within the wildlife corridors through development. The plans should be restricted to use of native species, creating native freshwater marsh and riparian scrub and forest cover along the new wildlife drainages, bordered by a cover of non-native grassland and oak woodland/savanna plantings. Plans for landscape improvements along each new wildlife corridor drainages should be prepared and implemented during the initial phase of a specific development, allowing cover vegetation and wildlife use to become established before buildout of the surrounding area.*

4.4-3(h) *The Creek Crossings provisions listed on page 95 of the proposed "Tassajara Design Guidelines" should be revised to include the following additional measure:*

- *To the extent possible, design pedestrian and bicycle trails along creek corridors to cross roadways rather then pass under them at creek crossings and*

proposed wildlife undercrossings. Where traffic volumes warrant pedestrian crossings under the roadway, such as at the Tassajara Creek crossing, a separate pedestrian tunnel should be provided to separate human and wildlife movement. Fencing and dense landscape screening should be provided between the path and creek for a minimum of 100 feet on either side of the joint undercrossing to further separate human and wildlife movement under the roadway.

Impact 4.4-4 Habitat for special-status taxa would be modified and eliminated.

Future development in the project area would further reduce the available habitat for a number of special-status taxa, and would affect essential habitat features such as breeding habitat for California red-legged frog and possibly nesting or denning locations for other taxa of concern. The *Design Guidelines* include recommendations to establish a one-quarter-mile buffer area around the golden eagle nest location in the open space area. With the exception of general provisions regarding protection of the golden eagle nest and subsequent information regarding aquatic species of concern, the proposed *Design Guidelines* do not include information specifically addressing other special-status taxa of concern.

Grading activities and the associated degradation of water quality could cause direct loss of California red-legged frog and possibly western pond turtle along creek corridors and other suitable habitat. Affected tributary streams which provide access to ponds with reported occurrences of red-legged frog include the intermittent blue-line stream on the Rapp property and the small tributary to Alamo Creek north of the major oak woodland (refer to Figure 4.4-2). Proposed development in the vicinity of the ponds on the Rapp property in Area J has been sited to minimize direct disturbance to the two stockponds which have supported the frog and turtle. However, future use in the vicinity of the ponds would require that they at minimum be retrofitted, necessitating that they be drained and possibly reconfigured. It should be noted that these and other ponds in the project area function primarily as water sources for livestock and are in a severely degraded condition. These features could actually be improved as habitat for the frog and turtle as long as possible management conflicts are carefully resolved. Detention basin maintenance and recreational uses along the main creeks, tributary streams and around ponds would contribute to the likelihood of an unauthorized "take" of individual frogs and turtles. Harassment and predation by children and pets could become a serious problem, particularly where the creeks border residential development and improved parks. Dispersal of adult frogs and pond turtles throughout the project area may become fragmented due to the absence of protective cover and suitable pool and pond retreat habitat along much of the Alamo and Tassajara creek corridors.

Following an initial review made during preparation of this Draft EIR that no provisions regarding red-legged frog and western pond turtle had been included in the *Design Guidelines*, an outline of a conceptual Habitat Preservation and Enhancement Plan was prepared by the applicant's biologist (TVPOA, 1994). Biological criteria related to habitat preservation, habitat and species management, construction activity provisions, public education, and long-term monitoring to be used in preparing a detailed Habitat Preservation and Enhancement Plan were identified by the applicant's biologist, with the assumption that the plan would be reviewed by representatives of the CDFG and USFWS. Given

the status of red-legged frog as a threatened species under the federal Endangered Species Act, the USFWS could require redesign of specific components of a particular project to avoid adverse impacts or compensation for the impacts through enhancement, relocation and off-site habitat restoration.

The recommended one-quarter-mile buffer area around the golden eagle nest appears adequate to protect the nest location from direct disturbance, assuming appropriate restrictions on construction activities and passive recreational use of the open space area. Passive recreational activities, such as hiking and horseback riding in the vicinity of the nest may still contribute to nest abandonment, although fencing has been proposed to restrict access. The loss of suitable foraging habitat and intensity of human activity on the valley floors and lower hillsides would, however, contribute to a decline in the suitability of the project area for eagles and other sensitive raptors. It is difficult to predict whether the eagle nest and other raptor nests would be used in the future following build-out of the project, but the suitability of the project area for nesting by sensitive raptors would be unavoidably diminished due to the intensive development and increased human activity.

Although no direct evidence of San Joaquin kit fox use was encountered during surveys, representatives of the USFWS have indicated that the project area is considered potential habitat for this species and that appropriate mitigation should be provided for loss of habitat (Larson, 1996). Individual kit fox retreating into dens during the day and individuals dispersing through the area could be at risk from construction activities as development proceeds in the project area. Development would be concentrated on the valley floors and lower hillside slopes, which is most likely the more suitable kit fox habitat in the project area. Although a considerable amount of foraging habitat would be retained as permanent open space in the hillsides along the western and eastern edges of the project area, no major corridors have been proposed across the floor of Tassajara Valley. This would result in fragmentation of the existing habitat, and eventual isolation of the permanent open space habitat in the Hidden Valley area to the west of the project area. Consultation with the USFWS and CDFG, and incorporation of mitigation provisions into some type of management plan, will be required for future developments within the project area. At minimum, this will most likely require conduct of pre-construction surveys and adherence to the *Standardized Recommendations for Protection of San Joaquin Kit Fox* (U.S. Fish and Wildlife Service, 1989).

The value of the site and adjacent undeveloped lands to other special-status bird species (i.e., black-shouldered kite, northern harrier, red-tailed hawk, loggerhead shrike, horned lark, yellow warbler, tricolored blackbird, burrowing owl, prairie flacon, peregrine falcon, ferruginous hawk, merlin and bald eagle) and American badger would be reduced due to the conversion of suitable foraging habitat, and an increase in human activity and disturbance. However, considerable foraging habitat and potential or known nesting locations for bird taxa of concern would be preserved in proposed open space areas, no known essential habitat features would be lost, and measures recommended to mitigate impacts on general wildlife use of the project area should serve to mitigate potential adverse impacts on these species. As with San Joaquin kit fox, there is a possibility that new nest or den locations could be established in the future within areas proposed for development, and pre-construction surveys would be required to confirm the presence or absence of taxa of concern, together with appropriate development restrictions if additional essential habitat is encountered, which has not been addressed in the *Design Guidelines*.

No special-status plant taxa were encountered during the field surveys or are suspected to occur in the project area. Many of the trees which would be removed to accommodate proposed development are mature valley oak, which was previously included on List 4 of the CNPS *Inventory*. Although valley oak as a species has no legal protective status, these and other mature trees should be preserved to the degree possible. The young black walnut trees in the project area are of agricultural origin and are, therefore, not considered of special-status. Assuming that measures recommended to minimize the loss of mature trees and provide for the re-establishment of native vegetation with locally available plant materials are implemented, removal of individual valley oak would not be considered a significant adverse impact.

The *Design Guidelines* currently contain only limited provisions regarding protection of special-status taxa, particularly for California red-legged frog and western pond turtle, and do not address the need for additional pre-construction surveys, and potential impacts on several wildlife species of concern would, therefore, be considered significant.

Mitigation Measures

All of the following mitigation measures are required to reduce impacts on special-status wildlife taxa of concern to a less-than-significant level. In addition, measures recommended above to mitigate potential impacts on wildlife resources would serve to partially reduce impacts on special-status wildlife taxa as well.

4.4-4(a) *The project applicant should consult with the USFWS and CDFG, and comply with the provisions of the state and federal Endangered Species Acts. This may be achieved through preparation of a habitat plan which provides adequate, binding mitigation for potential impacts on California red-legged frog, San Joaquin kit fox, and other special-status species. The plan should require conduct of pre-construction surveys for denning and nesting locations of special-status animal species known or suspected to occur within the project area. The pre-construction surveys should comply with agency protocol, where established. With regard to San Joaquin kit fox, mitigation should at minimum include incorporation of a major east-west wildlife corridor across the floor of Tassajara Valley as recommended in mitigation measure 4.4-3(c), and adherence to the "Standardized Recommendations for Protection of San Joaquin Kit Fox" (USFWS, 1989). With regard to California red-legged frog, mitigation should at minimum include revisions to the proposed Habitat Preservation and Enhancement Plan, as recommended in mitigation measure 4.4-4(d).*

4.4-4(b) *The Open Space and Natural Resources chapter of the proposed "Tassajara Design Guidelines" should be revised to include an additional section on Protection of Special-status Taxa, requiring pre-construction surveys. Species which should be addressed by preconstruction surveys include: known or possible additional future nest locations for golden eagle, black-shouldered kite, northern harrier, burrowing owl, red-tailed hawk and other raptors; known and possible additional future breeding and dispersal habitat*

for California red-legged frog and western pond turtle; possible future dens for San Joaquin kit fox and American badger; and potential roosting locations for pallid bat if large oak snags are to be removed by proposed development. This section should also:

- *Incorporate the habitat plan defined in consultation with the USFWS and CDFG, including revisions to the conceptual Habitat Preservation and Enhancement Plan for California red-legged frog and western pond turtle.*
- *Identify the need for pre-construction surveys to document the presence or absence of essential nesting and den locations during future review of specific development plans.*
- *Specify provisions to protect any additional sensitive resources if encountered.*
- *Indicate that consultation with the CDFG and USFWS should be provided and appropriate mitigation required if sensitive resources are encountered during supplemental surveys, where required by state and federal law.*

4.4-4(c) *The appendix to the proposed "Tassajara Design Guidelines" should be expanded to include an additional table addressing special-status taxa. The table should:*

- *Identify each species of concern and instances where pre-construction surveys are necessary.*
- *Characterize suspected essential habitat.*
- *Specify appropriate setbacks or construction restrictions to minimize disturbance if sensitive resources are encountered.*

4.4-4(d) *The conceptual Habitat Preservation and Enhancement Plan for California red-legged frog and western pond turtle should be incorporated into an overall habitat plan for special-status species and revised to:*

- *Encompass known and potential breeding and dispersal habitat along the Alamo Creek drainage.*
- *Provide for relocation where disturbance of existing habitat is unavoidable.*
- *Include creation of pond and pool habitat at 200- to 400-foot intervals along major creeks and tributary drainages to serve as retreat habitat for dispersing individuals where feasible from a hydrologic/sedimentation standpoint.*

4.4-4(e) *The Protection of Golden Eagle Nest provisions on page 98 of the proposed "Tassajara Design Guidelines" should be revised to read as follows:*

- *Major construction activities within one-half-mile line-of-sight to the golden eagle nest should be restricted to the period outside the raptor breeding season (i.e., construction permitted from July 15 to January 15) to avoid possible abandonment of the nest from construction-related disturbance. Major construction activities include: grading; roadway, utility and landscape installation; and building foundation, framing, roofing and exterior treatment.*

Impact 4.4-5 Existing wetland and other waters would be altered and partially eliminated.

Potential impacts to wetlands could include direct modifications to creek channels and seasonal wetlands to accommodate roadway crossings, flood control improvements, and other development, and indirect changes associated with the increased potential for erosion and water quality degradation. Potential erosion and degradation of the wetland and riparian habitat may result from increased urban runoff volumes and degraded water quality associated with proposed development. Proposed development would magnify the volume of runoff and potential for urban pollutants, with perhaps the greatest potential damage resulting from sedimentation during the construction phase of the project. Figure 4.4-3 shows areas of wetlands and other jurisdictional waters that would be filled and eliminated under the proposed Grading Plan, consisting primarily of other waters of the United States, and collectively affecting only a small fraction of the 14.12 acres of verified jurisdictional waters and wetlands. The largest affected jurisdictional area consists of an approximately 3.4 acres of degraded seasonal wetland between the two forks of Alamo Creek which would be eliminated and developed with residential use as part of the Wendt Ranch project.

To protect the major creeks and tributaries in the project area, the proposed *Design Guidelines* specify minimum development setbacks of 100 feet from Alamo and Tassajara creeks, and 50 feet from minor tributaries. While the proposed *Preliminary Development Plan* provides for the minimum setbacks along the main creeks, two tributaries indicated as intermittent blue-line streams on the USGS topographic survey of the area would be filled and eliminated; the drainages on the Brown in Area G and the Rapp-Tong/Cao properties in Area J, shown in Figure 4.4-3. While wetland vegetation is generally absent along these two watercourses, scattered valley oak and willow occur along the stream on the Brown property, and the drainage on the Rapp-Tong/Cao properties is most likely used as a dispersal corridor for California red-legged frog and western pond turtle, indicating that both of these features have some functional value as wildlife habitat.

Setbacks along major creek channels and minimization of loss of jurisdictional waters through re-creation of open drainages around the periphery of development would serve to partially protect these resources. Where disturbance is unavoidable, such as stream crossings, site-specific mitigation would be necessary to provide for replacement. The *Design Guidelines* include detailed provisions related to restoration and management of wetland-related habitat, including riparian forest and scrub, alkali meadows and seeps, freshwater marsh, minor tributaries and seasonal ponds. The loss of the estimated 3.4 acres of seasonal wetlands between the two forks of Alamo Creek would conflict with *General Plan* Policy 8-27, but this area is dominated by non-native species and has historically been used for dryland farming. Mitigation through establishment of out-of-kind more diverse seasonal wetlands or freshwater marsh habitat would provide greater value than the existing disturbed seasonal wetland in this location.

Modifications to wetlands and other waters of the United States, including roadway crossings and flood control improvements affecting the existing creeks, would be subject to jurisdictional review and approval by the Corps and the CDFG. Further review by representatives of these two agencies would focus on avoiding disturbance of sensitive features and minimizing the effects of unavoidable impacts. These agencies recommend avoidance of potential impacts to existing wetland habitat where possible, and require that replacement wetlands be provided where loss or modifications are unavoidable, often times at a replacement ratio of up to 3:1 (three acres replacement wetlands for each one acre lost to development).

Mitigation Measures

The following mitigation measures would be necessary for compliance with requirements of jurisdictional agencies and to ensure that potential impacts on wetland resources are reduced to a less-than-significant level.

4.4-5(a) *The general Natural Resource Protection provisions on page 92 of the proposed "Tassajara Design Guidelines" should be revised to include the following additional measure:*

- *All modifications to potential wetland and other waters, including filling of drainage swales, seasonal wetlands, creek crossings and flood control improvements, should be coordinated with representatives of the CDFG and Corps, as required by state and federal law, to ensure that any mitigation requirements and any design modifications are incorporated into the specific development plans during the initial stages of project review.*

4.4-5(b) *The intermittent blue-line streams on the Brown property in Area G and Rapp-Tong/Cao properties in Area J (Figure 4.4-4) should be retained or relocated as open channels and enhanced through riparian plantings with native trees and shrubs, providing a link between Tassajara Creek and uplands to the east and west of the valley floor.*

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4.5 TRAFFIC AND CIRCULATION

SETTING

Introduction

Agencies Involved

Transportation planning in the Tri-Valley area is coordinated by the Tri-Valley Transportation Council (TVTC), which consists of elected officials from each city and county in the Tri-Valley area (Contra Costa and Alameda Counties, Danville, San Ramon, Dublin, Pleasanton and Livermore). The TVTC prepared the Tri-Valley Transportation Plan (TVTP), portions of which serve the Measure C mandated Action Plan for the Contra Costa County jurisdictions. As one of its initial activities, the TVTC developed the Tri-Valley Transportation Model for use in transportation planning studies. The Tri-Valley Transportation Model is one of the four official subarea models in Contra Costa County and is supported by the Contra Costa Transportation Authority (CCTA). The agency charged with review of land use development proposals in unincorporated Contra Costa County is the Contra Costa County Community Development Department.

Scenarios Evaluated

The traffic analysis includes an evaluation of regionwide traffic conditions under a number of different scenarios, as identified and briefly described below.

Existing Conditions describe traffic conditions in 1996, with existing traffic volumes and the existing roadway network.

Year 2010 Background Conditions describe conditions in the year 2010 with land uses and transportation system detailed in the TVTP, except within the Tassajara Valley where land use development and the roadway network would be unchanged from existing conditions.

Year 2010 Project Conditions describe conditions in the year 2010 with land uses and transportation system detailed in the TVTP (the TVTP includes the Tassajara project).

These scenarios constitute the principal scenarios analyzed in this study. They are described in more detail in subsequent sections.

Existing Road System

The Tassajara project area is located in southern Contra Costa County near the Alameda County border. The study area corresponds roughly to what is called the Tri-Valley area—an area comprising southern Contra Costa County and north-central Alameda County. The study area was established to include all transportation facilities that could be impacted by the project, based on the CCTA's minimum project trip threshold. The study area includes the cities of San Ramon, Dublin, Pleasanton, and Livermore, the Town of Danville, and unincorporated areas of Alameda and Contra Costa Counties. The project site and study area are shown on Figure 4.5-1.

The existing roadway system in the Tri-Valley area is shown on Figure 4.5-2. The diagram illustrates the number of lanes on major roadways in the area, and the locations of high-occupancy vehicle (HOV) lanes. Regional access to the area is provided by Interstate 580 (I-580) and Interstate 680 (I-680).

I-580 is an east-west freeway extending from U.S. 101 in Marin County to Interstate 5 in Stanislaus County. Within the study area it is eight lanes wide with two auxiliary lanes between Foothill Boulevard and Tassajara Road.

I-680 is a north-south freeway extending from U.S. 101 in Santa Clara County to Interstate 80 in Solano County. Within the study area it is six lanes wide with HOV lanes from SR 24 in Walnut Creek to Alcosta Boulevard in Dublin.

Diablo Road is an east-west arterial extending from Hartz Avenue in downtown Danville to Mt. Diablo Scenic Boulevard. It is four lanes wide from Hartz Avenue to I-680, and varies from two- to four-lanes wide from there to Green Valley Road. Diablo Road is two lanes wide from Green Valley Road to Mt. Diablo Scenic Boulevard. It continues eastward as Blackhawk Road, joining Crow Canyon Road at the intersection with Camino Tassajara. An interchange is provided at I-680.

Camino Tassajara is a four-lane east-west arterial from Diablo Road to Lawrence Road. Between Lawrence Road and the Contra Costa-Alameda County line it serves as a two-lane rural road with an east-west orientation west of Finley Road and a north-south orientation south of Finley Road. At the county line Camino Tassajara becomes Tassajara Road, a two-lane north-south rural road that extends southward to I-580.

Sycamore Valley Road is a four-lane east-west arterial connecting San Ramon Valley Boulevard to Camino Tassajara. A partial cloverleaf interchange is provided at I-680.

Crow Canyon Road extends from I-580 in Castro Valley to Camino Tassajara in Danville. Within the study area it serves as an east-west arterial six lanes wide from San Ramon Valley Boulevard to El Capitan Drive, four lanes wide between El Capitan Drive and Tassajara Ranch Drive, and again six lanes wide from Tassajara Ranch Drive to Camino Tassajara. At I-680 a partial cloverleaf interchange is provided.

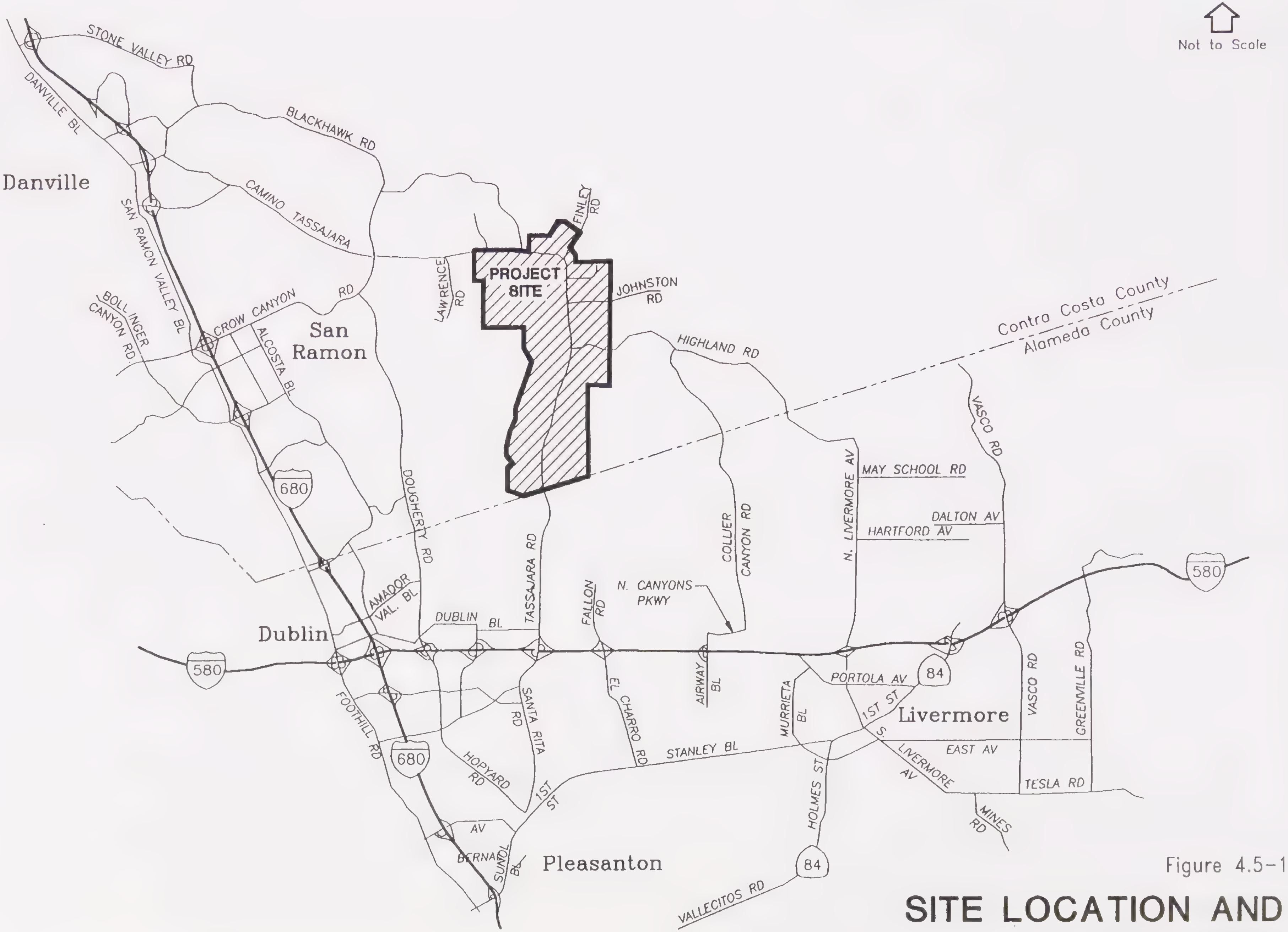

Figure 4.5-1

SITE LOCATION AND STUDY AREA

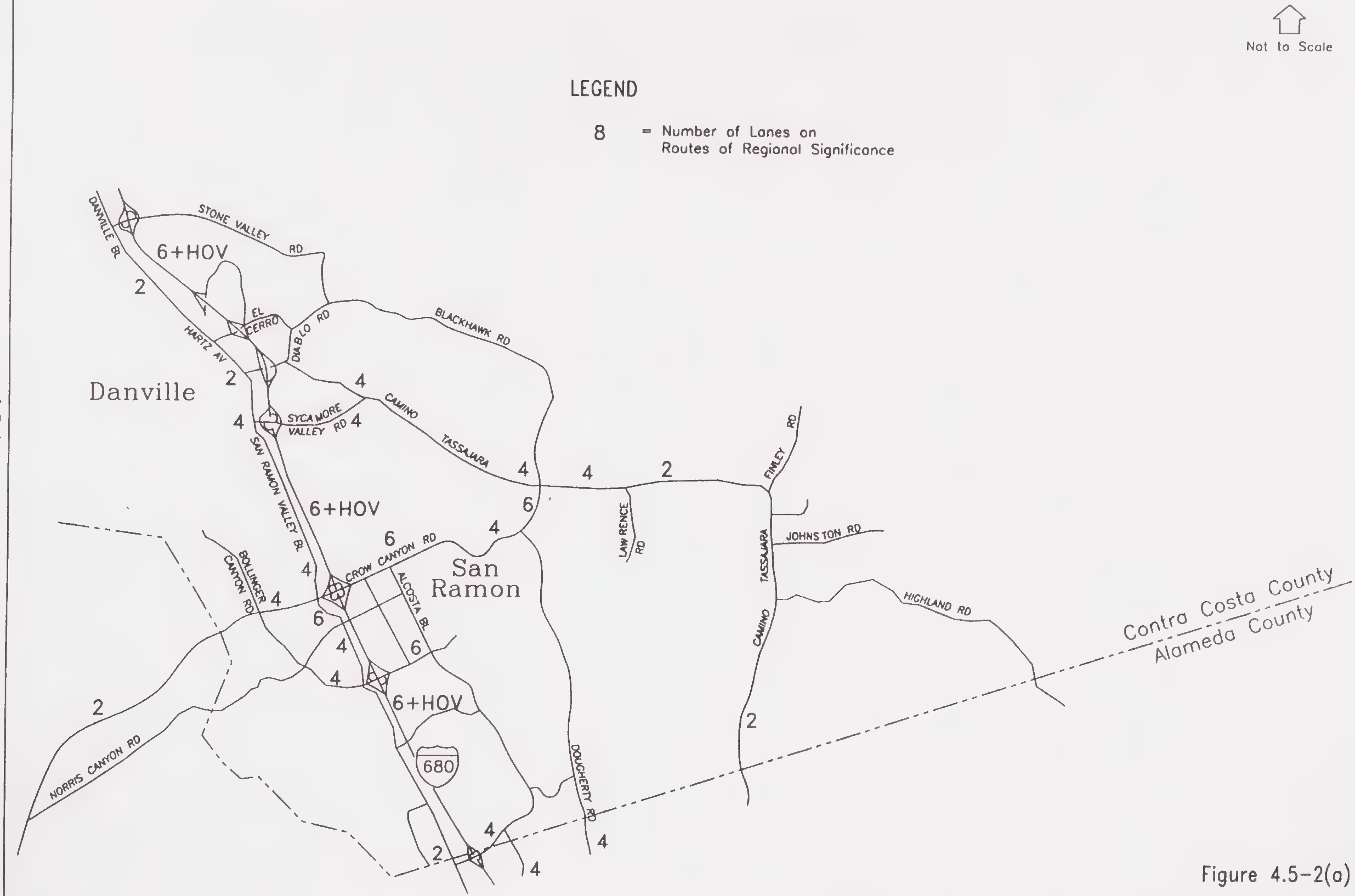

Figure 4.5–2(a)

EXISTING ROADWAY SYSTEM

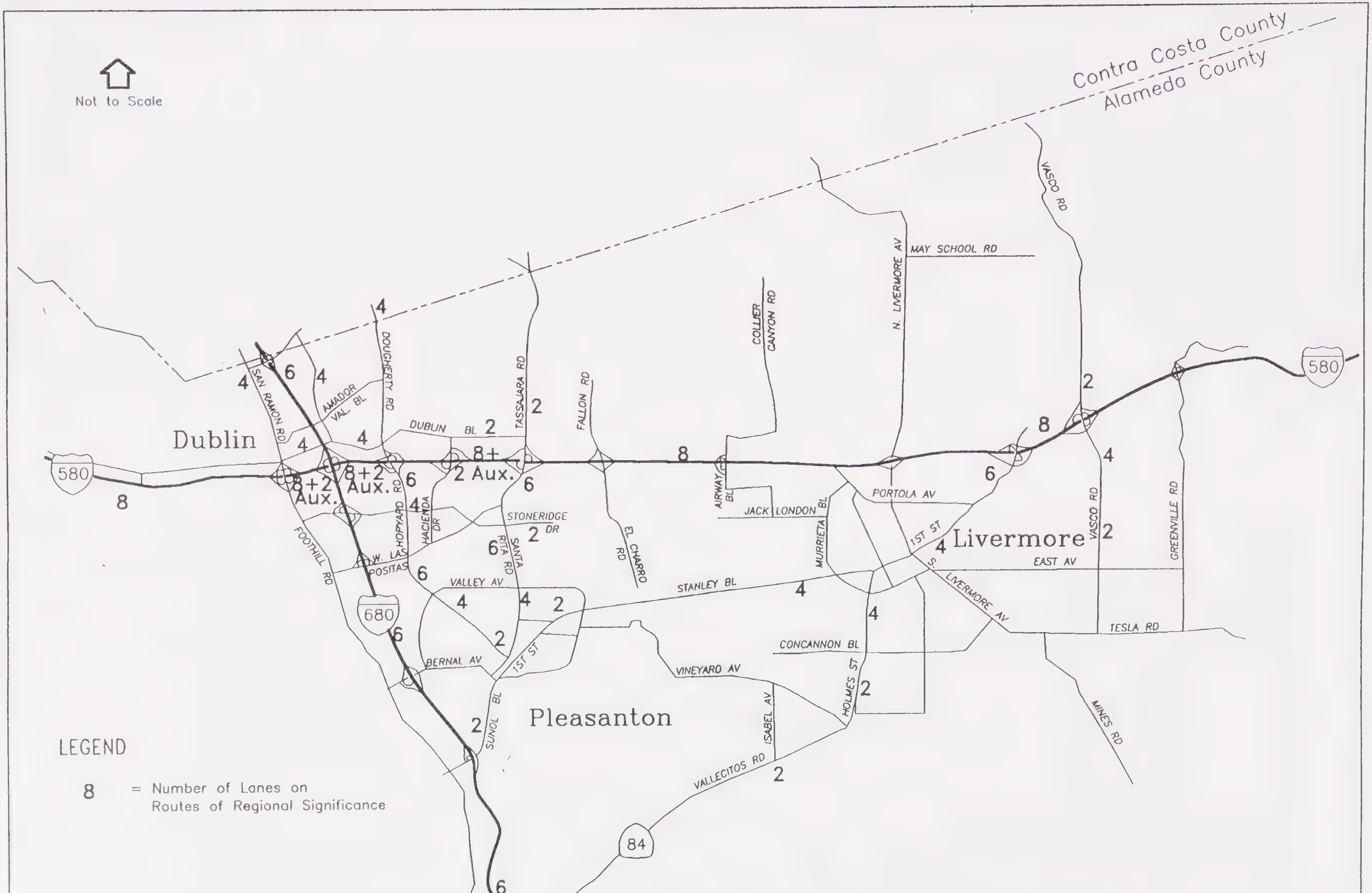

Figure 4.5-2(b)

EXISTING ROADWAY SYSTEM

Alcosta Boulevard is a four-lane arterial extending south from Crow Canyon Road to Old Ranch Road. From there it continues in a southwesterly direction to San Ramon Valley Boulevard. A full diamond interchange is provided at I-680.

Bollinger Canyon Road within the study area serves as an east-west arterial extending from San Ramon Valley Boulevard to just east of Alcosta Boulevard. It varies in width from four lanes east of Alcosta Boulevard to eight lanes at I-680. A partial cloverleaf interchange is provided at I-680.

Dougherty Road is a north-south roadway extending from Crow Canyon Road to I-580. Between Crow Canyon Road and the San Ramon city limits it functions as a four-lane arterial. From the city limits to Old Ranch Road it serves as a two-lane rural road. Dougherty Road widens to four lanes from Old Ranch Road to Dublin Boulevard. From there to I-580 it is six lanes wide. A partial cloverleaf interchange is provided at I-580.

Highland Road is a two-lane east-west rural road that extends from Camino Tassajara to the Contra Costa-Alameda County line. At its eastern end, just south of the county line, it connects to Manning Road which provides access to North Livermore Avenue.

Old Ranch Road is a four-lane east-west road connecting Alcosta Boulevard to Dougherty Road.

Dublin Boulevard is an east-west arterial extending from west of San Ramon Road to Tassajara Road. From San Ramon Road to Dougherty Road it is four lanes wide. Between Dougherty Road and Tassajara Road it is two lanes wide. No interchange is provided at the I-680 crossing.

San Ramon Valley Boulevard extends from Hartz Avenue in downtown Danville southward through San Ramon and into Dublin, where it is called San Ramon Road, and further southward into Pleasanton, where it is called Foothill Road. It is four lanes wide except in San Ramon, where it is six lanes wide between Crow Canyon Road and Bollinger Canyon Road, and in Pleasanton, where it is generally two lanes wide south of Las Positas Boulevard. A full interchange is provided where it meets I-580.

Stoneridge Drive is a four-lane east-west arterial extending from Foothill Road to east of Santa Rita Road. A full interchange is provided at its junction with I-680.

Hacienda Drive is a six-lane north-south arterial extending from Dublin Boulevard to Owens Drive, where it continues southward as a four-lane arterial to Las Positas Boulevard. A full interchange is provided at the I-580 crossing.

Las Positas Boulevard is an east-west arterial extending from Foothill Road to Santa Rita Road. Within the study area, from Hopyard Road to Santa Rita Road, it is four lanes wide. No interchange is provided at the I-680 crossing.

Santa Rita Road is a north-south arterial extending from I-580 to Stanley Boulevard in downtown Pleasanton. North of Valley Avenue it is six lanes wide; to the south it is four lanes wide. At I-580 a partial cloverleaf interchange is provided. North of I-680 it becomes Tassajara Road.

North Livermore Avenue extends from Manning Road north of Livermore in unincorporated Alameda County to First Street in downtown Livermore. Within the study area, from Manning Road to I-580, it serves as a two-lane rural road. Manning Road provides a connection to Highland Road. A full diamond interchange is provided at North Livermore Avenue and I-580.

Existing Traffic Conditions

Existing traffic conditions were evaluated for the AM and PM peak hours at 47 intersections in the vicinity of the proposed project site. The intersections are identified on Figure 4.5-3.

Existing Traffic Volumes

Existing traffic volumes consist of AM and PM peak-hour intersection turning-movement volumes for the 47 intersections referenced above. An effort was undertaken to collect 1996 traffic counts at all 47 intersections. At 41 of the 47 intersections 1996 counts were obtained for use in this analysis. Existing volumes at the other six intersections were based on traffic counts conducted between 1989 and 1994. In cases where traffic growth rates were known, the counts were factored upward to estimated 1996 levels.

Evaluation Criteria and Level of Service

The evaluation is based on existing traffic operations at 47 intersections and on future traffic operations on 20 freeway segments, one rural road (Highland Road was analyzed because of its unique characteristics and close proximity to the project) and at 77 (47 existing plus 30 additional) intersections. Contra Costa County Measure C requires that the transportation analysis include all signalized intersections that would serve 50 or more project trips. The intersections analyzed in this EIR were selected in accordance with this requirement.

Traffic operations were evaluated on the basis of level of service (LOS). Level of service is a qualitative description of traffic operations with values ranging from LOS A, which designates free-flow conditions, to LOS F, which signifies highly congested conditions. For the freeway segments, the segment volume-to-capacity (V/C) ratio was used as the evaluation criterion. For the intersections, the combined V/C ratios of the critical movements was used. The freeway and intersection V/C ratios were correlated to level of service as shown in Table 4.5-1. More detailed descriptions of level of service and corresponding conditions are included in Appendix C-I.

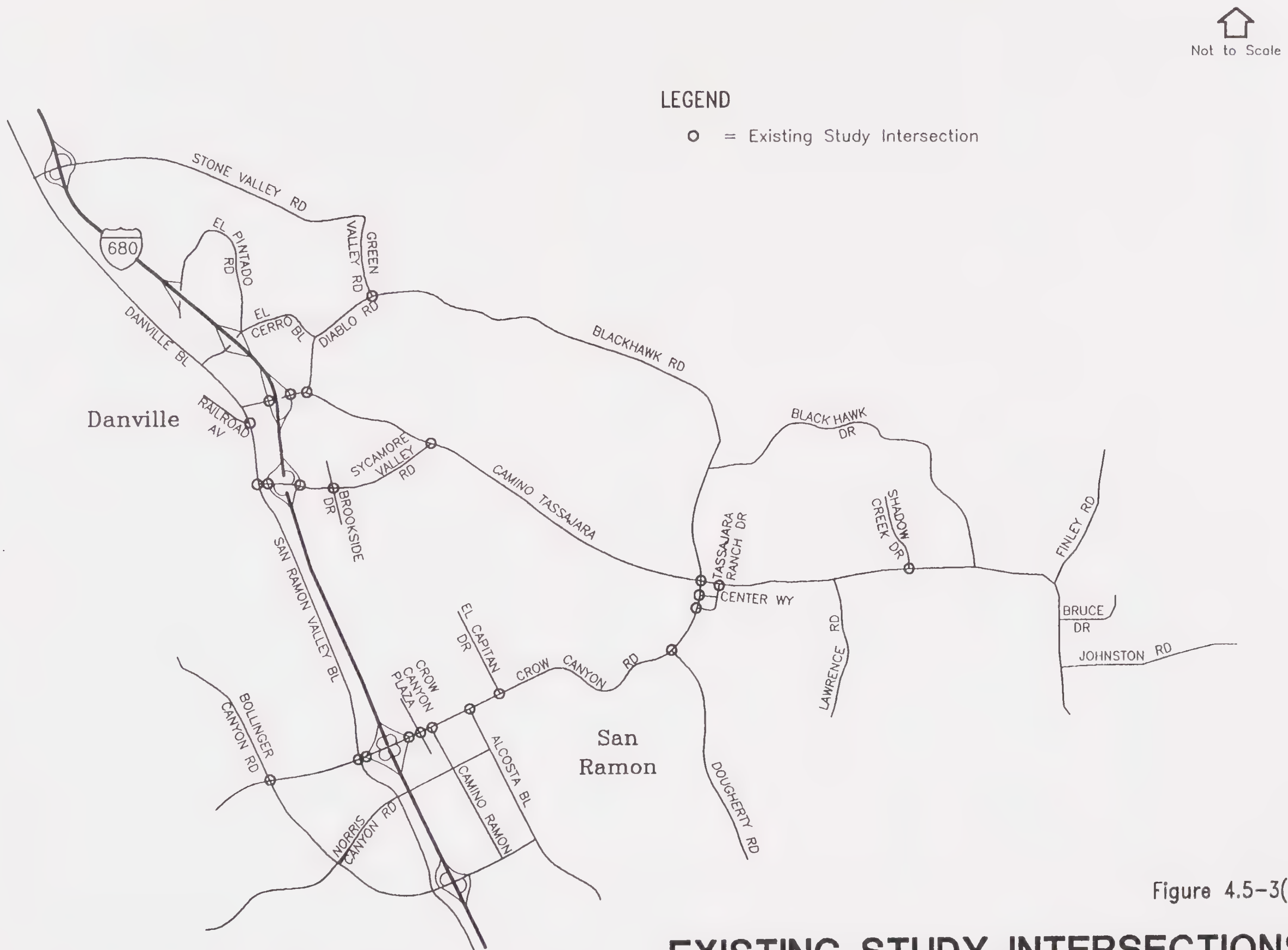

Figure 4.5–3(a)

EXISTING STUDY INTERSECTIONS
DANVILLE AND SAN RAMON

Figure 4.5-3(b)

EXISTING STUDY INTERSECTIONS
SAN RAMON, DUBLIN AND PLEASANTON

TABLE 4.5-1
LEVEL OF SERVICE CRITERIA

Level of Service	V/C Ratio	
	Freeways[1]	Intersections
A	Less than 0.262	Less than 0.600
B	0.262 to 0.417	0.600 to 0.699
C	0.418 to 0.626	0.700 to 0.799
D	0.627 to 0.793	0.800 to 0.899
E	0.794 to 1.000	0.900 to 0.999
F	Greater than 1.000	1.000 and Greater

[1] Source: 1994 *Highway Capacity Manual* for six- to eight-lane freeways and 60 mph free-flow speed.

Level of Service Methodology and Standards of Operation

The threshold where level of service (LOS) conditions change from acceptable to unacceptable are described in this section for signalized intersections, two-lane rural roads, freeways, and arterial streets.

Signalized Intersections. Level of service definitions for signalized intersections are provided in Appendix C-I. For the purpose of this EIR, the Contra Costa Measure C-1988 Growth Management Program Performance Standards for Basic Routes were used to establish the LOS threshold at all signalized intersections in the study area (i.e., intersections on basic routes and routes of regional significance as defined in Measure C-1988).

Rural Area:	LOS Low C, V/C $\leq$ 0.74
Semi Rural Area:	LOS High C, V/C$\leq$ 0.79
Suburban:	LOS Low D, V/C$\leq$ 0.84
Urban:	LOS High D, V/C $\leq$ 0.89
Central Business District:	LOS Low E, V/C $\leq$ 0.94

The Contra Costa Transportation Authority's *Volume-to-Capacity Contra Costa (VCCC)* analysis program procedures were used for signalized intersections. The VCCC method is based on the Transportation Research Board's *Circular 212 Planning Procedures.* However, instead of the national standard of 1,500 vehicles per hour per lane, the CCTA's *VCCC* program procedures assume 1,800 vehicles per hour per lane as the maximum intersection capacity. This capacity is based on traffic

surveys in Contra Costa. In this analysis, all intersections are considered urban, so that the LOS threshold is 0.89 for all intersections.

Two-Lane Rural Roads. Two-lane rural roads have operating characteristics that are unique from other transportation facilities. Capacities vary by terrain and the degree of passing restrictions rather than by the presence of controlled intersections. A description of the LOS standards for two-lane rural roads is provided in Appendix C-I. For this EIR, all two-lane rural roads were analyzed using the 1985 *Highway Capacity Manual* procedures. LOS D is considered to be the maximum acceptable standard in this EIR analysis.

Freeways. A description of LOS standards applied to freeways is included in Appendix C-I. Level of Service E, with V/C $\leq$ 0.99, was used as the maximum acceptable standard for freeway segments in this EIR analysis. The LOS E standard is a statewide standard established in the Congestion Management statute. State law allows the LOS F standard to be used if the facility was operating at that standard in 1991. However, the LOS F standard was not used in this EIR because it is based on non-environmental criteria.

Other Traffic Standards

Traffic Service Objectives established pursuant to Measure C-1988 for Routes of Regional Significance were not used as environmental standards since they involve non-environmental considerations. Page 10 of the Measure C-1988 Ordinance states:

> The Authority, jointly, with affected local jurisdictions, shall determine and periodically review the application of Traffic Service Standards on routes of regional significance. The review will take into account traffic originating outside of the county or jurisdiction, and environmental and financial considerations.

Measure C-1988 and the Congestion Management statute requires localities that review major land developments to include an evaluation of that development's impacts on major road facilities in relation to the applicable Traffic Service Objective and Congestion Management Program Level of Service Standard. This evaluation is summarized at the end of the traffic section.

Existing Intersection Operations

The level of review needed for a potential study intersection was based on a number of characteristics related to each intersection, including whether the intersection is signalized or unsignalized, existing traffic volumes and level of service, signal timing, the functional classification per the *General Plan,* and other factors. The County determined that 47 intersections would best serve as indicators of potential impacts of the proposed project, and were thus selected for further analysis. These intersections were the focus of detailed level of service analysis.

Intersection operations under existing conditions were determined from existing traffic volumes, known lane geometrics, and observed signal phasings. The intersection levels of service show that all 47 study intersections are currently operating at acceptable levels of service (LOS D or better) during the peak hours (Table 4.5-2). Level of service calculations for all study intersections are on file at the Contra Costa County Community Development Department, Fourth Floor, Martinez, California.

Existing Transit System

The Tri-Valley area is served by three transit agencies: the Central Contra Costa Transit Authority (CCCTA), the Livermore-Amador Valley Transit Authority (LAVTA), and Bay Area Rapid Transit (BART). The three agencies provide local or express bus service within the study area (Figure 4.5-4). However, there is currently no direct transit service to the Tassajara Valley planning area.

<u>CCCTA</u>

The CCCTA operates the County Connection (CCCTA, 1995), which offers bus service along the I-680 corridor between Walnut Creek and Pleasanton. Route 121 provides service between the Walnut Creek BART station and Stoneridge Mall in Pleasanton, with intermediate stops in Alamo, Danville, San Ramon and Dublin. Route 221 provides limited local service between Alamo and Bishop Ranch Business Park in San Ramon, with intermediate stops in Danville. Route 221 bus stops are located on the north side of Camino Tassajara west of Tassajara Ranch Drive/Blackhawk Plaza Circle and on the south side of Camino Tassajara west of Tassajara Village Drive. Express bus service between Walnut Creek and the San Ramon Intermodal Transit Facility is provided on Route 960.

<u>LAVTA</u>

LAVTA operates the local transit service in Dublin, Pleasanton, and Livermore. The service operates buses on several routes south of the Alameda-Contra Costa County line (WHEELS, 1993). Route 2, which operates between Dublin and Pleasanton, provides peak-hour service to the Hacienda Business Park in Pleasanton.

TABLE 4.5-2
INTERSECTION OPERATIONS UNDER EXISTING CONDITIONS

Node No.	Intersection			AM Peak Hour		PM Peak Hour	
	North/South Street	East/West Street	Location	V/C	LOS	V/C	LOS
1705	Alcosta Boulevard	Old Ranch Road	San Ramon	0.25	A	0.35	A
1743	I-680 NB Off-Ramp	Crow Canyon Road	San Ramon	0.55	A	0.49	A
1744	Camino Ramon	Crow Canyon	San Ramon	0.60	A	0.64	B
1760	San Ramon Valley	Crow Canyon	San Ramon	0.49	A	0.75	C
1776	Alcosta Boulevard	Crow Canyon Road	San Ramon	0.36	A	0.64	B
1777	Alcosta Boulevard	Norris Canyon	San Ramon	0.26	A	0.38	A
1789	Alcosta Boulevard	Bollinger Canyon Road	San Ramon	0.50	A	0.59	A
3537	Bollinger Canyon	Crow Canyon	Contra Costa County	0.49	A	0.50	A
3975	Dougherty Road	I-580 WB Off-Ramp	Dublin	0.40	A	0.50	A
3977	Dougherty Road	Dublin Boulevard	Dublin	0.57	A	0.81	D
3984	Dougherty Road	Amador Valley	Dublin	0.55	A	0.44	A
3985	Santa Rita Road	West Las Positas	Pleasanton	0.47	A	0.58	A
3988	Tassajara Road	I-580 WB Off-Ramp	Pleasanton	0.35	A	0.33	A
3993	Hopyard Road	I-580 EB Off-Ramp	Pleasanton	0.45	A	0.52	A
3997	Hopyard Road	West Las Positas	Pleasanton	0.41	A	0.47	A
4041	Santa Rita Road	I-580 EB Off-Ramp	Pleasanton	0.55	A	0.58	A
4058	Santa Rita Road	Stoneridge Drive	Pleasanton	0.50	A	0.55	A
6001	Crow Canyon Road	Center Way	Danville	0.35	A	0.40	A
6007	Tassajara Ranch Drive	Camino Tassajara	Danville	0.38	A	0.34	A
6410	I-680 SB Off-Ramp	Crow Canyon Road	San Ramon	0.52	A	0.61	B
7091	Crow Canyon Road	Tassajara Ranch	Danville	0.31	A	0.33	A
7147	Shadow Creek Drive*	Camino Tassajara	Contra Costa County	0.35	A	0.28	A
8249	San Ramon Valley	Sycamore Valley	Danville	0.33	A	0.56	A
8250	I-680 SB Off-Ramp	Sycamore Valley	Danville	0.40	A	0.49	A
8251	I-680 NB On-Ramp	Sycamore Valley	Danville	0.80	C	0.56	A
8252	Camino Tassajara*	Sycamore Valley	Danville	0.50	A	0.42	A
8255	I-680 SB Off-Ramp	Bollinger Canyon	San Ramon	0.41	A	0.31	A
8256	I-680 NB Off-Ramp	Bollinger Canyon	San Ramon	0.65	B	0.58	A

Table 4.5-2 *continued*

	Intersection			AM Peak Hour		PM Peak Hour	
Node No.	North/South Street	East/West Street	Location	V/C	LOS	V/C	LOS
8258	Crow Canyon Road	Camino Tassajara	Danville	0.51	A	0.52	A
8259	Dougherty Road	Crow Canyon	San Ramon	0.21	A	0.30	A
8260	Dougherty Road	Old Ranch Road	San Ramon	0.25	A	0.23	A
8265	Camino Tassajara*	Highland Road	Contra Costa County	0.09	A	0.11	A
8302	Hacienda Drive	I-580 EB Ramp	Pleasanton	0.30	A	0.19	A
8305	Hacienda Drive	I-580 WB Ramp	Dublin	0.24	A	0.16	A
9100	Camino Ramon	Bollinger Canyon	San Ramon	0.56	A	0.43	A
9101	Norris Canyon	Camino Ramon	San Ramon	0.36	A	0.42	A
9125	Alcosta Boulevard	Pine Valley	San Ramon	0.37	A	0.36	A
9150	Diablo Boulevard	Camino Tassajara	Danville	0.59	A	0.84	D
9164	Green Valley	Diablo Boulevard	Danville	0.75	C	0.49	A
9198	I-680 SB Off-Ramp	Diablo Boulevard	Danville	0.61	B	0.61	B
9204	I-680 NB Off-Ramp	Diablo Boulevard	Danville	0.67	B	0.69	B
9339	Camino Ramon	Executive Parkway	San Ramon	0.41	A	0.35	A
9340	Sunset Boulevard	Bollinger Canyon	San Ramon	0.56	A	0.82	D
9344	Crow Canyon Plaza	Crow Canyon	San Ramon	0.45	A	0.66	B
9355	Brookside	Sycamore Valley	Danville	0.49	A	0.33	A
9357	San Ramon Valley	Railroad Avenue	Danville	0.28	A	0.44	A
9414	El Capitan Drive	Crow Canyon	San Ramon	0.74	C	0.61	B

* Denotes intersection located on project site.

Source: Barton-Aschman, 1996.

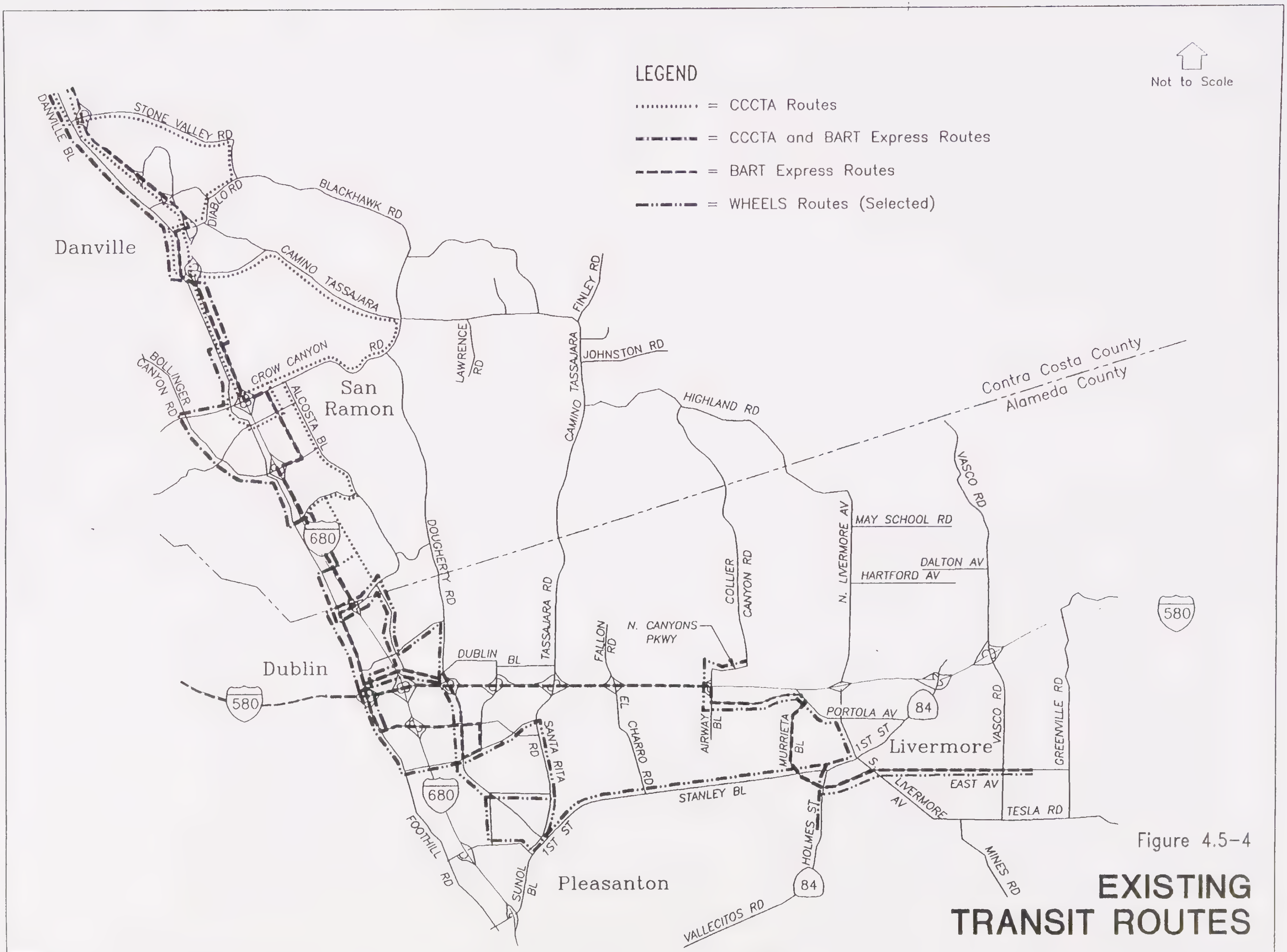

Figure 4.5-4

EXISTING TRANSIT ROUTES

BART and BART Express

BART does not currently provide rail service to the Tri-Valley area. BART does, however, provide bus service (BART, 1996) to the Tri-Valley area from the Fremont and Concord rail lines. Bus routes U, UL, UP, and UX operate along the I-580 corridor between the East Bay and the Tri-Valley area. Bus Route U provides service from Dublin to the Hayward BART Station and Bus Routes UL, UP, and UX provide access from Livermore and Pleasanton to the Bayfair BART Station in San Leandro. Express Route UX provides direct service to the Hacienda Park and Ride. Bus Routes D, DUX, and DX operate along the I-680 corridor between Pleasanton and San Ramon. Express Route DX provides service between the Walnut Creek BART station and the Bishop Ranch Business Park in San Ramon, with intermediate stops in Danville. Route DUX provides service between the Bishop Ranch Business Park in San Ramon and the Hacienda Business Park in Pleasanton, with an intermediate stop in Dublin. Route D provides service between the Walnut Creek BART station and Stoneridge Mall in Pleasanton, with intermediate stops in Alamo, Danville, San Ramon, and Dublin. An extension of BART rail service from Castro Valley to Dublin/Pleasanton is now under construction and expected to be completed by 1997.

Existing Bicycle Circulation

There are numerous existing bicycle facilities, or bikeways, in the study area (Figure 4.5-5). Following the Caltrans designations for bicycle facilities (Caltrans, 1992) each is designated as either a Class I, Class II, or Class III bikeway. Class I bikeways are bike paths with exclusive right-of-way and minimal cross flow by motorized vehicles. Class II bikeways are bike lanes striped within the paved areas of roadways and established for the preferential use of bicycles. Class III bikeways are bike routes on streets or sidewalks that allow shared use of bicycles with vehicle or pedestrian traffic.

Class I bikeways are located along Dougherty Road between Old Ranch Road and I-580, San Ramon Road between Alcosta Boulevard and I-580, Bernal Avenue (Pleasanton) between I-680 and Main Street, East Avenue (Livermore) near Vasco Road, and along the San Ramon Creek in Danville.

Class II bikeways are provided on numerous roadways throughout the study area, as indicated in Figure 4.5-5.

Class III bikeways are located on Hopyard Road between I-580 and Division Street, Santa Rita Road between Stanley Boulevard and I-580, Foothill Road between I-580 and Stoneridge Drive, and on Stoneridge Drive between Foothill Road and Hopyard Road.

Bicyclists are also free to use other roadways in the Tri-Valley area except for I-580 and I-680.

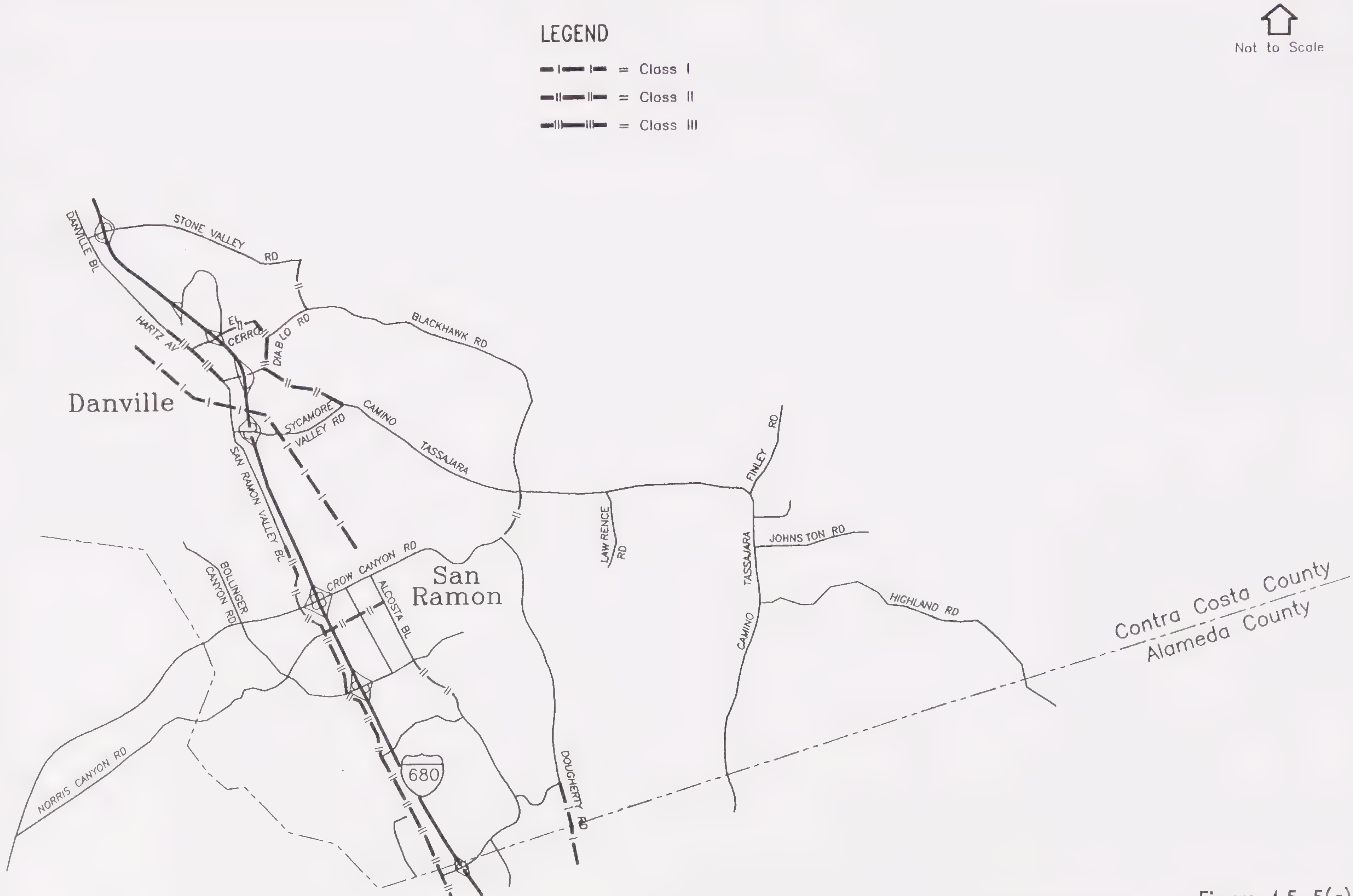

Figure 4.5-5(a)

EXISTING BIKEWAYS

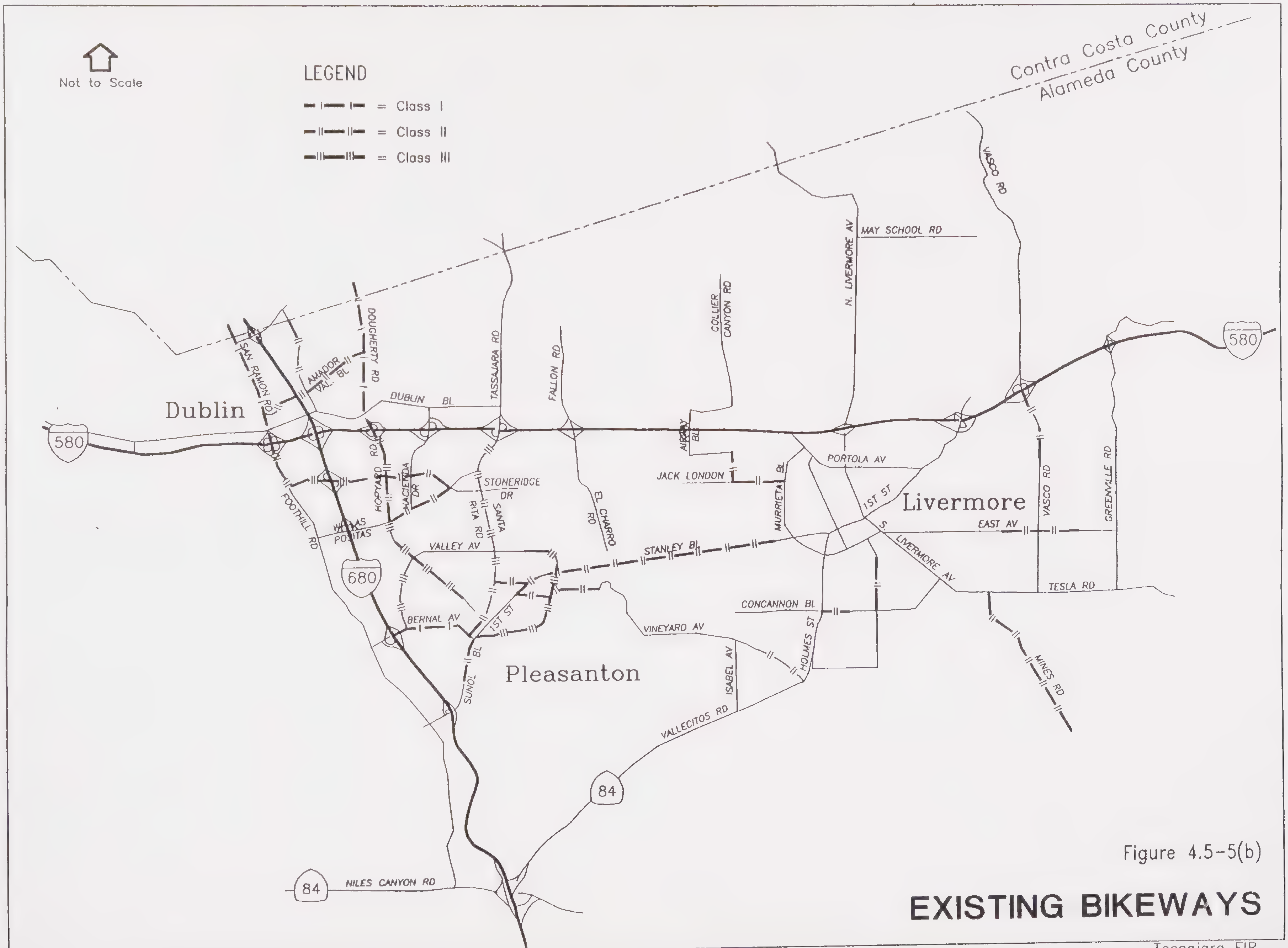

Figure 4.5-5(b)

EXISTING BIKEWAYS

Year 2010 Background Conditions Analysis

The TVTC produced land use and roadway network assumptions for the 2010 horizon year as input to the model. These assumptions encompass the approved general plans of the TVTC jurisdictions, as well as the approved Mountain House development in San Joaquin County and the Discovery Bay West development in East Contra Costa County, constituting the 2010 background conditions[1] evaluated in this EIR.

Tri-Valley Travel Model

The Tri-Valley Model was developed for the TVTC to provide a transportation planning tool capable of examining land use and transportation alternatives. One of the primary applications of the model is to provide traffic forecasts for EIR traffic impact analysis. The Tri-Valley Model is a subset of the two countywide models (Contra Costa and Alameda), which in turn are a subset of the Regional Metropolitan Transportation Commission (MTC) transportation planning model system. The original Tri-Valley Model was developed in 1993. Since then, numerous model refinements and improvements have been made. In the summer of 1996, the 2010 land use inputs were updated to Association of Bay Area Governments (ABAG) *Projections '94* and the network assumptions were reviewed and corrected to reflect the most recent assumptions shared by the TVTC. These modifications were incorporated into the Tri-Valley model and used to develop the traffic forecasts for this EIR. This model, based on *Projections '94* land use assumptions for 2010, is an interim model. The TVTC is currently in the process of validating the model using *Projections '94.* Some additional model refinements were incorporated in order to more accurately reflect the development plans of the Tassajara project. A description of these modifications are provided in Appendix C-II.

Inventories of land uses for geographic areas are generally made at five- or ten-year increments. The most recent "existing" land use data available for the Tri-Valley area is 1990. The 1990 land use data was used because the Tri-Valley Transportation Model was calibrated against 1990 traffic data.

The 1990 land use totals in the Tri-Valley area are summarized in Table 4.5-3. The land uses are expressed in terms of housing and employment data for year 1990. These totals pertain to the land use database developed from ABAG *Projections '92,* and from local data provided by the Tri-Valley jurisdictions. The breakdown of the household and employment data by jurisdiction indicates the distribution of the land uses throughout the Tri-Valley area.

[1] Year 2010 background conditions are the same as year 2010 conditions without the project.

TABLE 4.5-3
TRI-VALLEY 1990 AND 2010 BACKGROUND LAND USES

Planning Area	1990 Households	1990 Jobs	2010 Households	2010 Jobs	Increase Households	Increase Jobs
Alamo and Blackhawk	6,011	1,772	7,906	2,277	1,895	505
Danville	10,999	6,133	14,720	8,282	3,721	2,149
San Ramon	13,171	27,681	15,885	44,183	2,714	16,502
Dougherty Valley	137	7	10,356	5,365	10,219	5,365
Tassajara Valley	95	21	95	21	0	0
Other Contra Costa Co.	467	93	869	100	402	0
Dublin	6,788	11,163	7,549	13,081	761	1,918
East Dublin	49	445	13,245	23,046	13,196	22,601
Pleasanton	19,762	28,363	30,276	58,360	10,514	29,997
Livermore	20,819	33,506	27,005	50,843	6,186	17,337
North Livermore	38	2,574	11,253	17,462	11,215	14,888
Other Alameda County	50	1,093	806	1,417	756	324
Total	78,386	112,851	139,965	224,437	61,579	111,586

Source: Tri-Valley Transportation Council.

2010 Background Land Uses

The 2010 background land use consists of the aggregation of development that is expected by the various TVTC members in their respective jurisdictions by 2010. Table 4.5-3 shows the 2010 background land uses, expressed in terms of housing and employment by jurisdiction. The land use summary also shows the expected change in housing and employment between 1990 and 2010.

2010 Background Road System

The TVTP details an array of transportation improvements that, when completed, will define the Tri-Valley transportation system in the year 2010 (Figure 4.5-6). The TVTP has been officially adopted by all TVTC jurisdictions. By adopting the plan, the jurisdictions have committed to providing the planned new streets and widenings contained therein. Many of the planned street facilities are assumed to be provided by adjacent development as conditions of approval. Other transportation elements will be funded by a combination of known public sources and as-yet-to-be-adopted regional impact fees. The timing of specific road improvements will be dependent on need and available funding. The following is a list of the most significant improvements. The full list of roadway improvements is included in Appendix C-III.

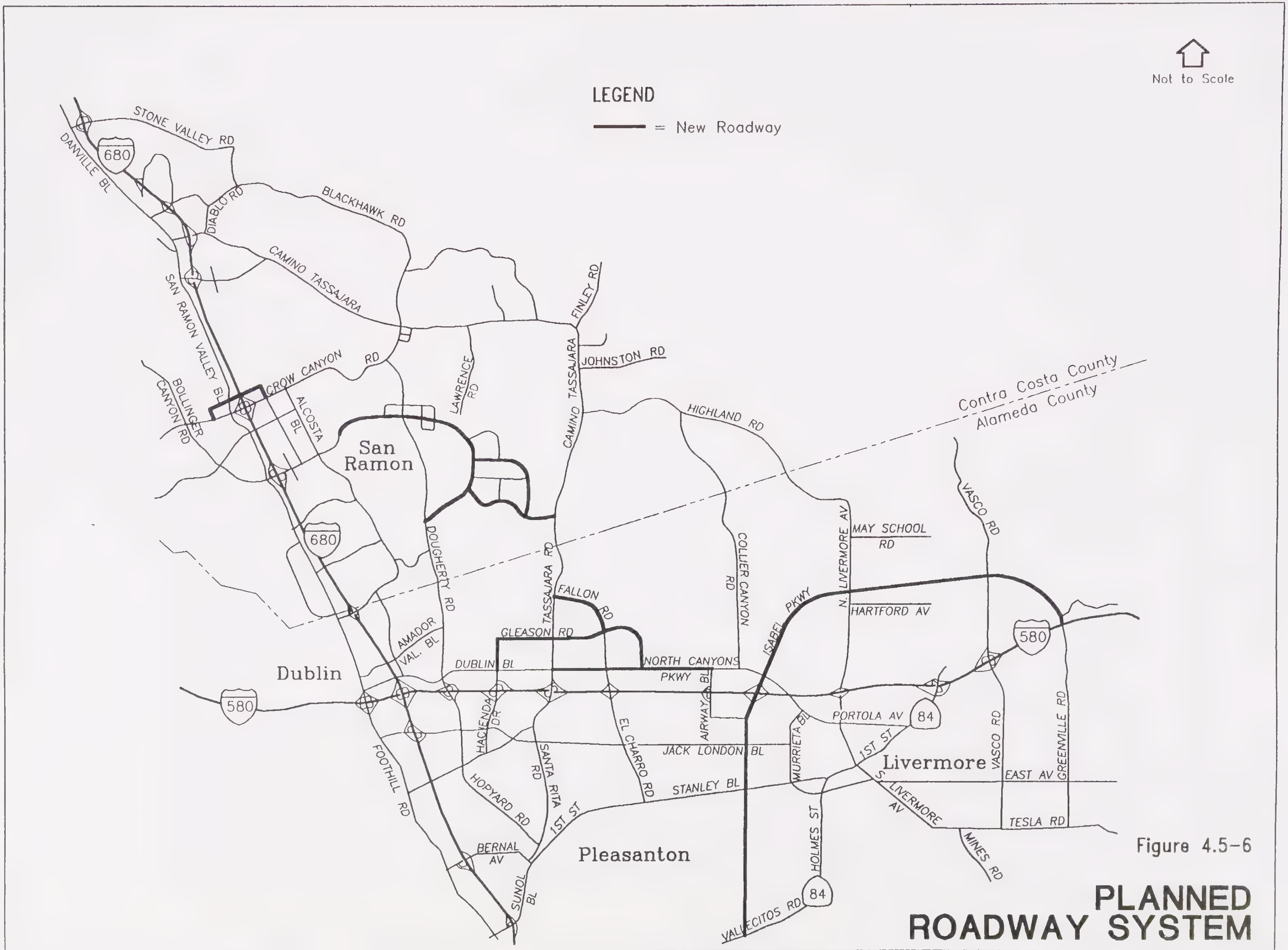

Figure 4.5-6

PLANNED ROADWAY SYSTEM

Auxiliary Lanes on I-680. From Diablo Road to Bollinger Canyon Road.

I-580/I-680 Interchange. Direct connector (flyover) ramp for southbound-to-eastbound traffic.

Route 84. Completion of Isabel Avenue as Route 84, six lanes, new interchange at Isabel Avenue and I-580, plus widening of Vallecitos Road to four lanes.

BART Extension. Rail service to Tri-Valley with stations at West Dublin/Pleasanton and East Dublin/Pleasanton, reoriented local bus service to serve the BART stations.

Isabel Extension. Extension of Isabel Avenue as eight-lane/six-lane/four-lane arterial from I-580 to Vasco Road.

Bollinger Canyon Road Extension. From San Ramon city limits through the Dougherty Valley area, six lanes, plus construction of Windemere Parkway (four lanes) between Bollinger Canyon Road and Tassajara Road.

Dublin Boulevard Extension. Further extension of Dublin Boulevard from Tassajara Road to North Canyons Parkway in Livermore, widening to six lanes throughout.

Dougherty Road Widening. To eight lanes from I-580 to Dublin Boulevard, six lanes from Dublin Boulevard to Crow Canyon Road.

Dougherty Valley Project On-Site Roadway System. The general locations of the Dougherty Valley principal on-site roadways are shown in Appendix C-III. These roadways include Gale Ranch Road, Monarch Road, and East Branch Road. These Dougherty Valley project-specific roadways are in addition to the existing and future regional roadways (Bollinger Canyon Road, Dougherty Road, Windemere Parkway) that would pass within the boundaries of the Dougherty Valley area.

2010 Background Transit System

The 2010 background transit system includes the transit improvement plans identified in the TVTP for implementation by 2010.

The most significant change to transit service in the year 2010 will be the extension of BART rail service into the Tri-Valley region. The Pleasanton/Dublin rail line will extend from Hayward and San Leandro along I-580 into Dublin and Pleasanton. A west station will be located near San Ramon/ Foothill Road and an east station will be located near Dougherty/Hopyard Road. The 2010 transit system will also include the addition of bus service to the Dougherty Valley, reorientation of routes to serve the BART stations, and an increase in express bus service.

The TVTP indicates that transit would serve the Tassajara Valley in 2010. The County Connection and LAVTA are expected to implement coordinated bus service to include peak-hour service along Camino Tassajara and Tassajara Road. Route 41 would provide service between Bishop Ranch Business Park and the Dougherty/Hopyard BART station, with 30-minute headways. Route 141 would provide service between Danville and Pleasanton, with 60-minute headways.

Year 2010 daily transit ridership would be 103,330 which compares to 39,277 under 1990 conditions. However, the increase in transit ridership will primarily keep pace with population and job growth. The transit mode share is expected to increase slightly from four percent of all trips in 1990 to five percent by 2010.

2010 Background Bicycle and Pedestrian Circulation

The TVTC has adopted a system of proposed bikeways in the Tri-Valley area (Figure 4.5-7), as detailed in the TVTP. In the project area, the bikeway plan designates Camino Tassajara as a bike route (Class III facility) and calls for bike lanes (Class II facility) on Tassajara Road.

Pedestrian facilities (sidewalks and pedestrian paths) are located throughout the Tri-Valley area, primarily in areas of residential and commercial development. Under 2010 background conditions there would be no pedestrian facilities along Camino Tassajara or elsewhere on the proposed project site.

While encouraging bicycling and walking through the provision of bikeways and sidewalks, the TVTC in developing the Tri-Valley Transportation Model made the conservative assumption that the proportional share of trips attributed to these modes would remain constant. That is, the Tri-Valley Model assumes in 2010 no higher percentage walking or bicycle usage than occurs today.

2010 Background Traffic Volumes

The Tri-Valley Transportation Model was used to produce AM and PM peak-hour traffic assignments under 2010 background conditions. Appendix C-IV shows the forecasted 2010 background traffic volumes on roadways throughout the study area.

2010 Background Traffic Operations

Highland Road Operations

Traffic operations on the *off-site* segment of Highland Road were analyzed using rural roadway analysis methods. The rural road analysis showed that Highland Road would operate at an acceptable LOS D in both the AM and PM peak hours. This analysis is detailed in Appendix C-V.

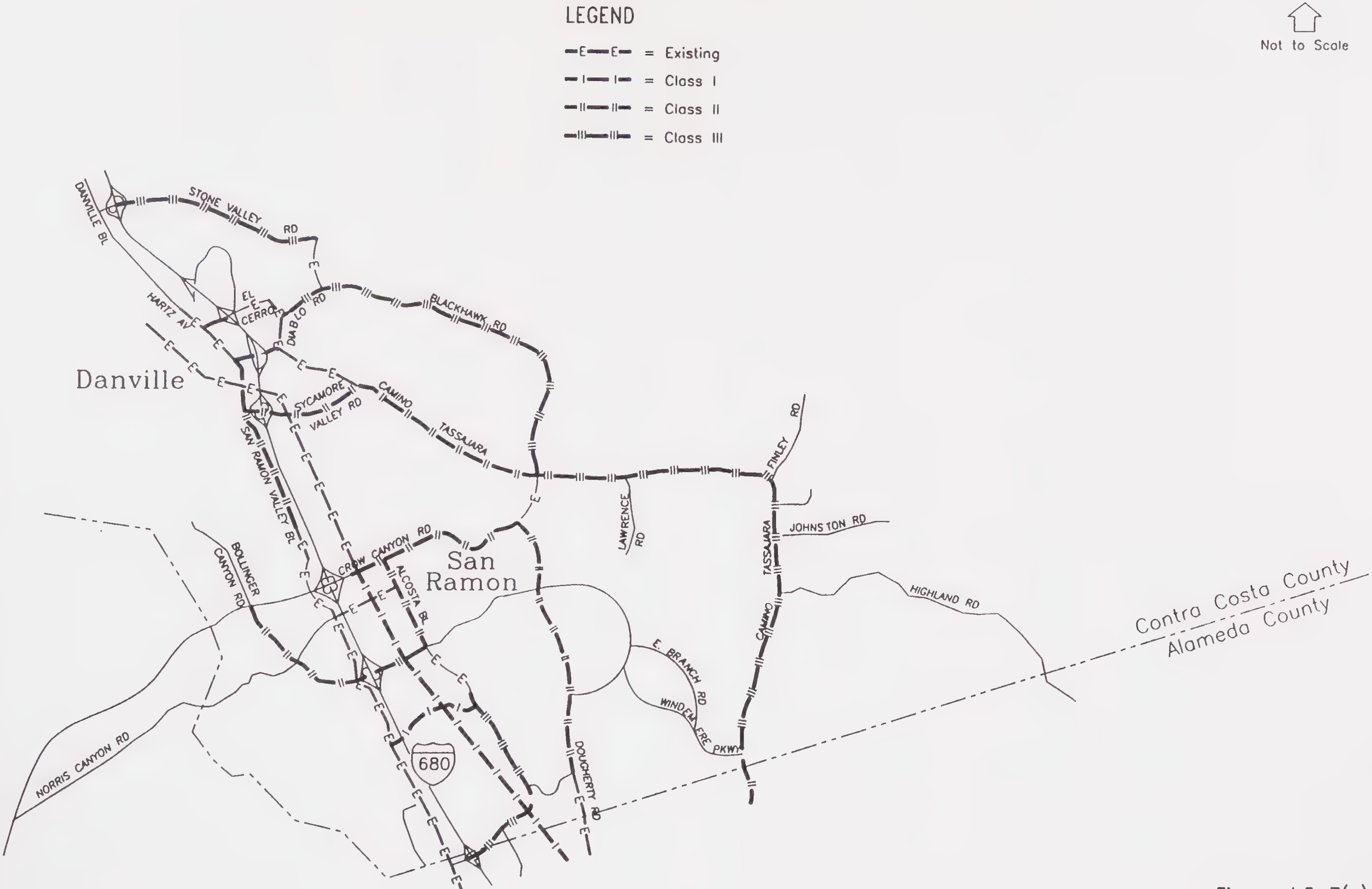

Figure 4.5-7(a)

PROPOSED BIKEWAYS

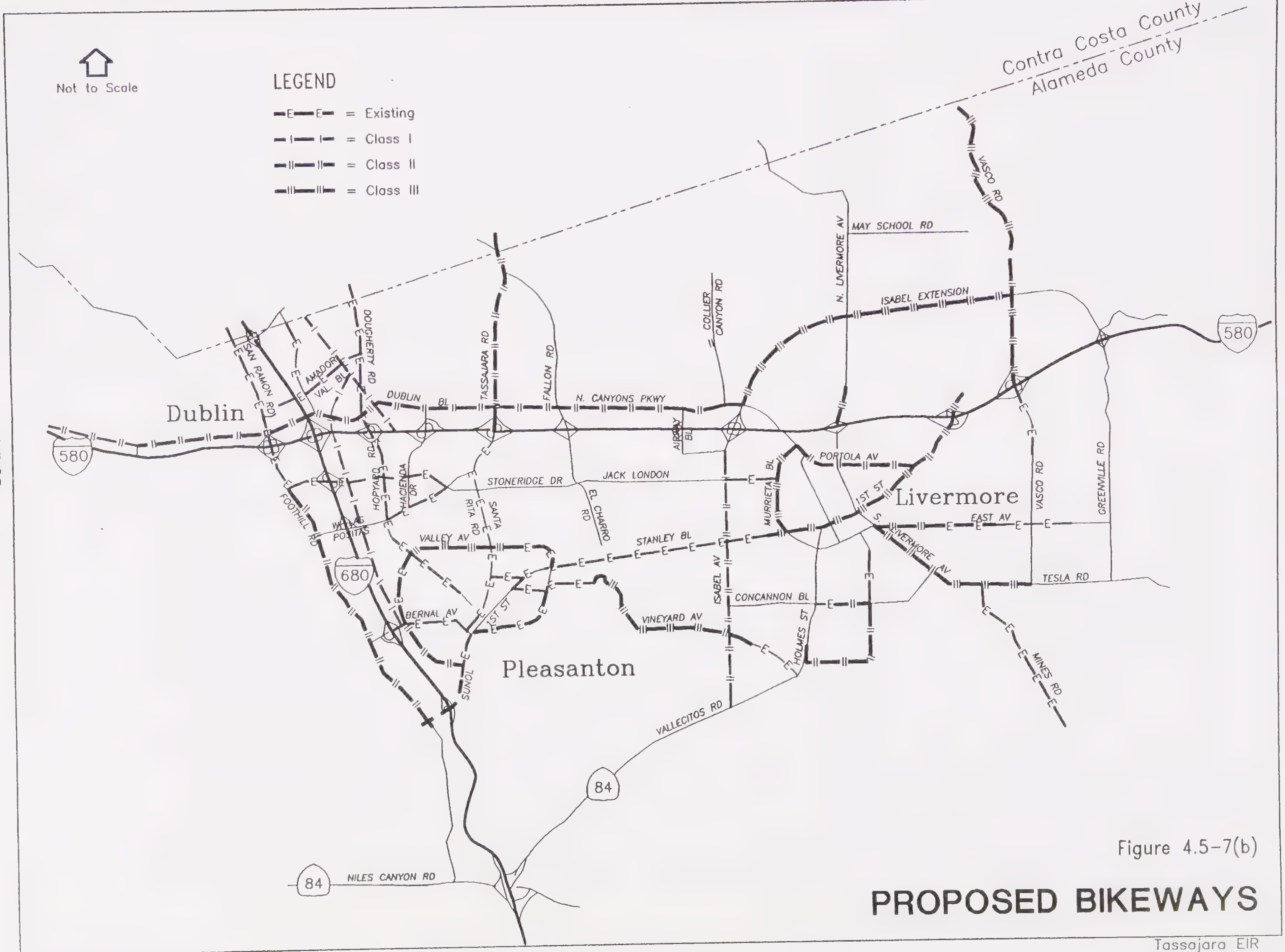

Figure 4.5-7(b)

PROPOSED BIKEWAYS

Freeway Operations

Freeway operations were evaluated using V/C ratios for each direction of 10 selected freeway segments in the study area. The results show that substandard operations are expected on 6 of the 20 directional freeway segments during one of the peak hours (Table 4.5-4).

TABLE 4.5-4
FREEWAY OPERATIONS UNDER 2010 BACKGROUND CONDITIONS

					AM Peak Hour			PM Peak Hour		
Roadway	Segment	Direction	HOV Lanes	Capacity	Volume	V/C[2]	LOS	Volume	V/C[2]	LOS
I-680	El Pintado to	NB	Yes	6,600	6,680	1.01	F	6,160	0.93	E
	El Cerro	SB	Yes	6,600	5,100	0.77	D	6,910	1.05	F
I-680	Sycamore to	NB	Yes	7,700	6,110	0.79	D	6,070	0.79	D
	Crow Canyon	SB	Yes	7,700	5,000	0.65	D	6,180	0.80	E
I-680	Crow Canyon to	NB	Yes	7,700	5,550	0.72	D	4,630	0.60	C
	Bollinger Canyon	SB	Yes	7,700	3,820	0.50	C	5,170	0.67	D
I-680	Alcosta to I-580	NB	No	6,600	6,160	0.93	E	4,950	0.75	D
		SB	No	6,600	4,030	0.61	C	5,450	0.83	E
I-680	West Las Positas to	NB	No	6,600	5,050	0.77	D	4,840	0.73	D
	Bernal	SB	No	6,600	4,630	0.70	D	6,170	0.93	E
I-580	Schaffer Ranch to	EB	No	9,900	4,340	0.44	C	8,210	0.83	E
	San Ramon	WB	No	9,900	8,510	0.86	E	5,720	0.58	C
I-580	Hopyard/Dougherty to	EB	No	9,900	5,490	0.55	C	9,720	0.98	E
	Hacienda	WB	No	9,900	9,600	0.97	E	7,140	0.72	D
I-580	Hacienda to	EB	No	9,900	4,480	0.45	C	9,960	1.01	F
	Santa Rita/Tassajara	WB	No	9,900	9,940	1.00	F	6,730	0.68	D
I-580	El Charro/Fallon to	EB	Yes	8,800	4,600	0.52	C	10,150	1.15	F
	Airway	WB	Yes	8,800	9,230	1.05	F	6,180	0.70	D
I-580	Vasco to Greenville	EB	No	8,800	2,780	0.32	B	7,810	0.89	E
		WB	No	8,800	7,700	0.88	E	2,970	0.34	B

Notes:

1 V/C standard is 0.99 for all freeway segments.

2 For HOV segments, HOV volumes and capacities are excluded from the calculation, that is, the volumes pertain to low-occupancy vehicles and the capacities pertain to mixed-flow (non-HOV) lanes only. For non-HOV segments, the volumes pertain to all vehicles and the capacities pertain to total capacity.

Intersection Operations

Study Intersections. The intersections analyzed under 2010 background conditions include the 47 existing study intersections and 24 additional intersections (Figure 4.5-8). The additional intersections are either those that will be created as part of the improved roadway network or those that already exist but are currently underutilized.

Figure 4.5-8(a)

YEAR 2010 BASELINE STUDY INTERSECTIONS DANVILLE AND SAN RAMON

LEGEND

● = Study Intersection

Figure 4.5-8(b)

YEAR 2010 BASELINE STUDY INTERSECTIONS
SAN RAMON, DUBLIN AND PLEASANTON

Figure 4.5-8(c)

YEAR 2010 BASELINE STUDY INTERSECTIONS
LIVERMORE

Intersection Lane Geometrics. The intersection lane geometries assumed for 2010 background conditions were established from the TVTP and from input by local jurisdictions and the Contra Costa County Community Development Department. The level of service calculations reflect the assumed lane configurations.

The VCCC method was used to evaluate intersection levels of service for the 71 intersections under 2010 conditions. The level of service results show that six of the 71 study intersections are expected to operate at a substandard LOS E or worse during at least one of the peak hours (Table 4.5-5). The level of service calculations for all 71 study intersections are on file at the County offices.

Relevant Plans and Policies

Contra Costa County has several planning documents that provide policy and procedure guidance for transportation planning.

Measure - C (1988)

The current transportation planning approach began in 1988 with the passage of Measure C. Measure C established a one-half cent sales tax in Contra Costa County to fund a specified set of transportation improvements. It also included a growth management element that established Level of Service (LOS) standards for the transportation system and mandated that the standards be maintained on certain routes as growth occurs.

Measure C created the Contra Costa Transportation Authority (CCTA) as the agency responsible for implementing its provisions. The CCTA has further refined the policies and procedures included in Measure C through a series of published documents. Of particular importance to transportation analysis are their Growth Management Implementation documents, which are also included in the Contra Costa County General Plan. These specify the methodology to be used for traffic studies, which was followed in the preparation of this EIR.

Measure C draws a distinction between streets that primarily serve local jurisdictions, which are called *basic routes,* and streets that serve multiple jurisdictions, called *routes of regional significance.* Measure C specifies the LOS standards for basic routes; they vary from a volume-to-capacity ratio of 0.74 for rural areas to 0.94 for central business districts. For the Tassajara Valley analysis, the area has been redesignated as urban, with a corresponding V/C threshold of 0.89.

TABLE 4.5-5
INTERSECTION OPERATIONS UNDER 2010 BACKGROUND CONDITIONS

Node	Intersection		Location	AM Peak Hour		PM Peak Hour	
	North/South Street	East/West Street		V/C	LOS	V/C	LOS
1107	Monarch Road	Bollinger Canyon	CC County	0.59	A	0.60	B
1111	W. of Monarch	Bollinger Canyon	CC County	0.79	C	0.65	B
1573	Tassajara Road	Dublin Blvd.	Alameda Co	0.94	E	0.93	E
1705	Alcosta Blvd.	Old Ranch Road	San Ramon	0.70	C	0.86	D
1743	I-680 NB Off-Ramp	Crow Canyon Road	San Ramon	0.65	B	0.64	B
1744	Camino Ramon	Crow Canyon Road	San Ramon	0.95	E	0.75	C
1760	San Ramon Valley	Crow Canyon Road	San Ramon	0.56	A	0.78	C
1776	Alcosta Blvd.	Crow Canyon Road	San Ramon	0.60	B	0.58	A
1777	Alcosta Blvd.	Norris Canyon	San Ramon	0.28	A	0.39	A
1789	Alcosta Blvd.	Bollinger Canyon	San Ramon	0.78	C	0.90	E
3537	Bollinger Canyon	Crow Canyon	CC County	0.64	B	0.63	B
3975	Dougherty/Hopyard Road	I-580 WB Off-Ramp	Dublin	0.69	B	0.86	D
3977	Dougherty Road	Dublin Blvd.	Dublin	0.88	D	0.89	D
3984	Dougherty Road	Amador Valley	Dublin	0.72	C	0.77	C
3985	Santa Rita Road	W. Las Positas	Pleasanton	0.65	B	0.97	E
3987	Tassajara Road	Gleason Avenue	Alameda Co	0.52	A	0.52	A
3988	Tassajara Road	I-580 WB Off-Ramp	Pleasanton	0.53	A	0.60	B
3993	Hopyard/Dougherty Road	I-580 EB Off-Ramp	Pleasanton	0.57	A	0.72	C
3997	Hopyard Road	W. Las Positas	Pleasanton	0.62	B	1.03	F
4041	Santa Rita Road	I-580 EB Off-Ramp	Pleasanton	0.63	B	0.64	B
4058	Santa Rita Road	Stoneridge Drive	Pleasanton	0.77	C	0.96	E
5340	Camino Tassajara	Bruce Drive	CC County	0.35	A	0.37	A
5341	Camino Tassajara	S. Village Center	CC County	—	—	—	—
5811	Camino Tassajara	Windemere Pkwy	CC County	0.66	B	0.50	A
5901	Blackhawk Drive	Camino Tassajara	CC County	0.29	A	0.40	A
5919	N. Links Road	Camino Tassajara	CC County	—	—	—	—
5920	Bollinger Canyon	S. of E. Branch	CC County	0.41	A	0.51	A
5921	Bollinger Canyon	E. Branch Road	CC County	0.35	A	0.51	A
5943	Camino Tassajara	E. Orchard Road	CC County	—	—	—	—
5978	N. Livermore Avenue	Isabel Pkwy	Alameda Co	0.38	A	0.53	A
6001	Crow Canyon Road	Center Way	Danville	0.39	A	0.48	A
6007	Tassajara Ranch	Camino Tassajara	Danville	0.56	A	0.39	A
6366	Dougherty Valley	Bollinger (N)	CC County	0.66	B	0.85	D
6370	Tassajara Road	Fallon Road	Alameda Co	0.44	A	0.49	A
6410	I-680 SB Off-Ramp	Crow Canyon Road	San Ramon	0.77	C	0.54	A
6437	Gleason	Dublin Blvd.	Alameda Co	0.64	B	0.65	B
6993	Camino Tassajara	Country Loop	CC County	—	—	—	—
6994	Camino Tassajara	Loop Connector	CC County	—	—	—	—
6995	Camino Tassajara	Johnston Road	CC County	0.36	A	0.39	A

Table 4.5-5 *continued*

	Intersection			AM Peak Hour		PM Peak Hour	
Node	North/South Street	East/West Street	Location	V/C	LOS	V/C	LOS
7091	Crow Canyon Road	Tassajara Ranch	Danville	0.48	A	0.51	A
7147	Shadow Creek	Camino Tassajara	CC County	0.33	A	0.25	A
8249	San Ramon Valley	Sycamore Valley	Danville	0.45	A	0.73	C
8250	I-680 SB Off-Ramp	Sycamore Valley	Danville	0.43	A	0.50	A
8251	I-680 NB On-Ramp	Sycamore Valley	Danville	0.27	A	0.43	A
8252	Camino Tassajara	Sycamore Valley	Danville	0.43	A	0.19	A
8255	I-680 SB Off-Ramp	Bollinger Canyon	San Ramon	0.63	B	0.57	A
8256	I-680 NB Off-Ramp	Bollinger Canyon	San Ramon	0.47	A	0.70	C
8258	Crow Canyon Road	Camino Tassajara	Danville	0.75	C	0.67	B
8259	Dougherty Road	Crow Canyon Road	San Ramon	0.58	A	0.68	B
8260	Dougherty Road	Old Ranch Road	San Ramon	0.64	B	0.50	A
8265	Camino Tassajara	Highland Road	CC County	0.51	A	0.57	A
8302	Hacienda Drive	I-580 EB ramp	Pleasanton	0.70	C	0.72	C
8305	Hacienda Drive	I-580 WB ramp	Dublin	0.46	A	0.71	C
8306	Hacienda Drive	Dublin Blvd.	Dublin	0.56	A	0.87	D
8363	Gale Ranch Road	Bollinger Canyon	CC County	0.54	A	0.54	A
8364	Dougherty Road	Bollinger (S)	CC County	0.53	A	0.40	A
8365	Bollinger Canyon	Windemere Pkwy	CC County	0.53	A	0.60	B
8366	Bollinger Canyon	N. of E. Branch	CC County	0.49	A	0.50	A
9100	Camino Ramon	Bollinger Canyon	San Ramon	0.89	D	0.76	C
9101	Norris Canyon	Camino Ramon	San Ramon	0.40	A	0.39	A
9125	Alcosta Blvd.	Pine Valley	San Ramon	0.43	A	0.54	A
9126	Finley Road	Camino Tassajara	CC County	0.38	A	0.40	A
9129	N. Village Center	Camino Tassajara	CC County	—	—	—	—
9150	Diablo Blvd.	Camino Tassajara	Danville	0.40	A	0.32	A
9164	Green Valley	Diablo Blvd.	Danville	0.73	C	0.60	B
9198	I-680 SB Off-Ramp	Diablo Road	Danville	0.51	A	0.34	A
9204	I-680 NB Off-Ramp	Diablo Road	Danville	0.33	A	0.38	A
9339	Camino Ramon	Executive Pkwy	San Ramon	0.48	A	0.54	A
9340	Sunset Blvd.	Bollinger Canyon	San Ramon	0.87	D	0.89	D
9344	Crow Canyon Plaza	Crow Canyon Road	San Ramon	0.60	B	0.81	D
9349	Lawrence Road	Camino Tassajara	CC County	0.37	A	0.71	C
9355	Brookside	Sycamore Valley	Danville	0.55	A	0.31	A
9357	San Ramon Valley	Railroad Avenue	Danville	0.43	A	0.56	A
9414	El Capitan Drive	Crow Canyon Road	San Ramon	0.74	C	0.67	B
9954	Fallon Road	Gleason Road	Alameda Co	0.46	A	0.54	A
9956	Fallon/El Charro Road	I-580 WB ramp	Alameda Co	0.68	B	0.78	C
9957	El Charro/Fallon Road	I-580 EB ramp	Alameda Co	0.41	A	0.47	A

Source: Barton-Aschman, 1996.

Tri-Valley Action Plan

According to Measure C, level of service standards for Routes of Regional Significance are to be established through a cooperative process among jurisdictions and are to be codified in a document called an *Action Plan*. In 1995 the Action Plan was adopted for the Tri-Valley jurisdictions. Portions of the Action Plan were adopted by the CCTA as part of the Countywide Comprehensive Transportation Plan (July 1995), which will be used as the basis for evaluating transportation impacts on Routes of Regional Significance. Traffic Service Objectives in the form of level of service standards are established for these facilities. Routes of Regional Significance in the vicinity of Tassajara include I-680, Camino Tassajara, Sycamore Valley Road, Crow Canyon Road, Dougherty Road, and Bollinger Canyon Road. A detailed discussion pertaining to these Routes of Regional Significance relevant to the LOS Traffic Service Objectives (TSOs) is in Appendix C-VI.

The Tri-Valley Action Plan also includes a financing plan to fund the transportation improvements. Any widening of local arterial roads such as Camino Tassajara would be funded by new development. There are improvements specified, however, for the state highway and freeway system that cannot be attributed to any one development. Some are already partially publicly funded. However, a significant portion of the funding would need to come from a regional traffic impact fee on new development.

Contra Costa County, the Town of Danville, and the City of San Ramon just recently approved the Southern Contra Costa Fees Joint Exercise Agreement that would partially fund specified projects, identified in the Action Plan, that are located in Contra Costa County. The TVTC is also currently evaluating a regional transportation impact fee for projects in Contra Costa County and Alameda County that Southern Contra Costa County jurisdictions may adopt.

Congestion Management Program

Passage of Proposition 111 in 1990 required each California urban county to designate a Congestion Management Agency (CMA) to prepare and update a Congestion Management Program (CMP), encompassing all jurisdictions. In the Fall of 1990, Contra Costa County and Contra Costa cities designated the CCTA as the CMA. The CCTA, functioning as the Congestion Management Agency in Contra Costa County, produced the Congestion Management Program (CMP) for Contra Costa County. An objective of the CMP is that to apply and monitor traffic LOS standards on designated state highways and principal streets, establishing a CMP Road Network. The only CMP road in the Contra Costa study area is I-680, north of the County line. A detailed discussion pertaining to the CMP Road Network relevant to the LOS standards is in Appendix C-VII.

Contra Costa County General Plan

In addition to policies and procedures guiding traffic analysis for new development, the *Contra Costa County General Plan* includes goals and implementation measures relevant to the design of the circulation system. These implementation measures are the basis upon which the proposed Tassajara circulation system is evaluated in subsequent sections of this EIR.

IMPACTS AND MITIGATION MEASURES

Significance Criteria for Traffic Impacts

In this EIR, the operation of transportation facilities is examined without the project and with the project. Impacts and mitigation measures are identified only under conditions that include the project (future with project and cumulative).

Based on CEQA guidelines, a traffic increase from the project or from cumulative development is considered in this EIR to be a significant impact if the associated changes to the transportation system:

- Conflict with adopted environmental plans and goals of the community where it is located; and

- Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system.

These general CEQA provisions provide the basis for the specific criteria that have been applied in this EIR to evaluate the significance of project-related traffic increases. This EIR establishes thresholds for determining when a traffic increase becomes unacceptable.

Future conditions without the project (2010 background conditions) and with the project (2010 project conditions) have been compared according to the following criteria to identify significant impacts.

- If a facility is projected to operate at an acceptable LOS without the project, and the project is not projected to increase the V/C ratio, the impact is considered less-than-significant.

- If a facility is projected to operate at an acceptable LOS without the project, and the project is projected to increase the V/C ratio but not create an unacceptable LOS, the impact is considered less-than-significant.

- If a facility is projected to operate at an acceptable LOS without the project, and the project is projected to cause the facility to operate at an unacceptable LOS, the impact is considered significant. For an impact thus created, the project is *solely* responsible for mitigation.

- If a facility is projected to operate at an unacceptable LOS without the project, and the project is projected to cause an increase in the V/C ratio, the impact is considered significant. For an impact thus created, the project is *partially* responsible for mitigation.

- If a facility is projected to operate at an unacceptable LOS without the project, and the project causes a decrease in the V/C ratio, this impact is considered beneficial.

Significance Criteria for Traffic Safety

Based on CEQA guidelines, a traffic safety impact from the project or from cumulative development is considered in this EIR to be a significant impact if the associated changes to the transportation system result in conditions that conflict with adopted road design standards that address sight distance, roadway width, spacing between intersections and driveways, and other safety-related requirements. The project is solely responsible for the mitigation of an impact thus created.

Significance Criteria for Parking

Based on CEQA guidelines, a parking impact from the project or from cumulative development is considered in this EIR to be a significant impact if the associated changes to the transportation system result in:

- Insufficient parking capacity on-site or off-site and cause illegal parking.
- Conflicts with parking design standards. The project is solely responsible for the mitigation of an impact thus created.

Significance Criteria for Alternative Transportation Modes

Based on CEQA guidelines, an impact on alternative transportation modes from the project or from cumulative development is considered in this EIR to be a significant impact if associated changes to the transportation system result in:

- Conflicts with adopted policies supporting alternative transportation modes (e.g., bus turnouts, bicycle racks). The project is solely responsible for the mitigation of an impact thus created.
- Insufficient capacity of alternative transportation modes that will result in increased use of the automobile or will discourage use of alternative modes of transportation. The project is solely or partially responsible for the mitigation of such impact depending on conditions without the project.

Project Level of Responsibility for Impacts and Mitigations

For each mitigation measure there is an assignment of responsibility for the funding of its implementation. Thus, with each mitigation measure comes the assessment that the project is *solely responsible* or *partially responsible* for funding the mitigation measure. The level of responsibility is determined by the nature of the impact, as described in the previous section on significance criteria.

In the case of an impact for which the project is deemed solely responsible, the project would bear the full cost of mitigation. In the case of an impact for which the project is deemed partially responsible, the project would bear a percentage of the mitigation cost based on the project's percentage contribution to traffic in relation to other sources of additional future traffic. A separate effort (not part of this study) will be undertaken to ascertain the project's percentage responsibility for each impact and mitigation measure.

Note that for each project impact that requires a capital improvement, the project applicant will be responsible to pay the jurisdiction in which the impact occurs and the affected jurisdiction will be responsible for implementing the mitigation measure. All mitigation measures were developed in consultation with the affected jurisdictions.

Project Description

Project-Related Roadway Improvements

The roadway system assumed under year 2010 project conditions includes the previously described 2010 network with the addition of Tassajara project-specific roadway improvements and the internal project circulation system (Figure 4.5-9). The principal change provided by the project would be the widening of Camino Tassajara to four and six lanes within the project boundaries and the addition of several intersections on Camino Tassajara. The intersections analyzed under 2010 project conditions include the 71 intersections analyzed as part of the 2010 background scenario, plus six new intersections created by the internal circulation system of the project.

Project Land Uses

The land use totals for year 2010 with the project are the same as shown previously (Table 4.5-3), but with the addition of 6,200 households (5,950 households within the project and 250 households on an adjoining parcel) and 582 jobs in the Tassajara area.

Project Trip Generation, Distribution, Assignment

The Tri-Valley Transportation Model was used to forecast project-generated traffic and assign the new peak-hour trips to the roadway network. The project is projected to generate about 4,800 trips in the morning peak hour and 6,100 trips in the evening peak hour (Table 4.5-6). About 17 percent of these in the morning and 23 percent in the evening will be trips internal to the site. These primarily represent school trips and shopping trips plus some work trips and social/recreational trips that stay on site due to the mix of land uses within the project area.

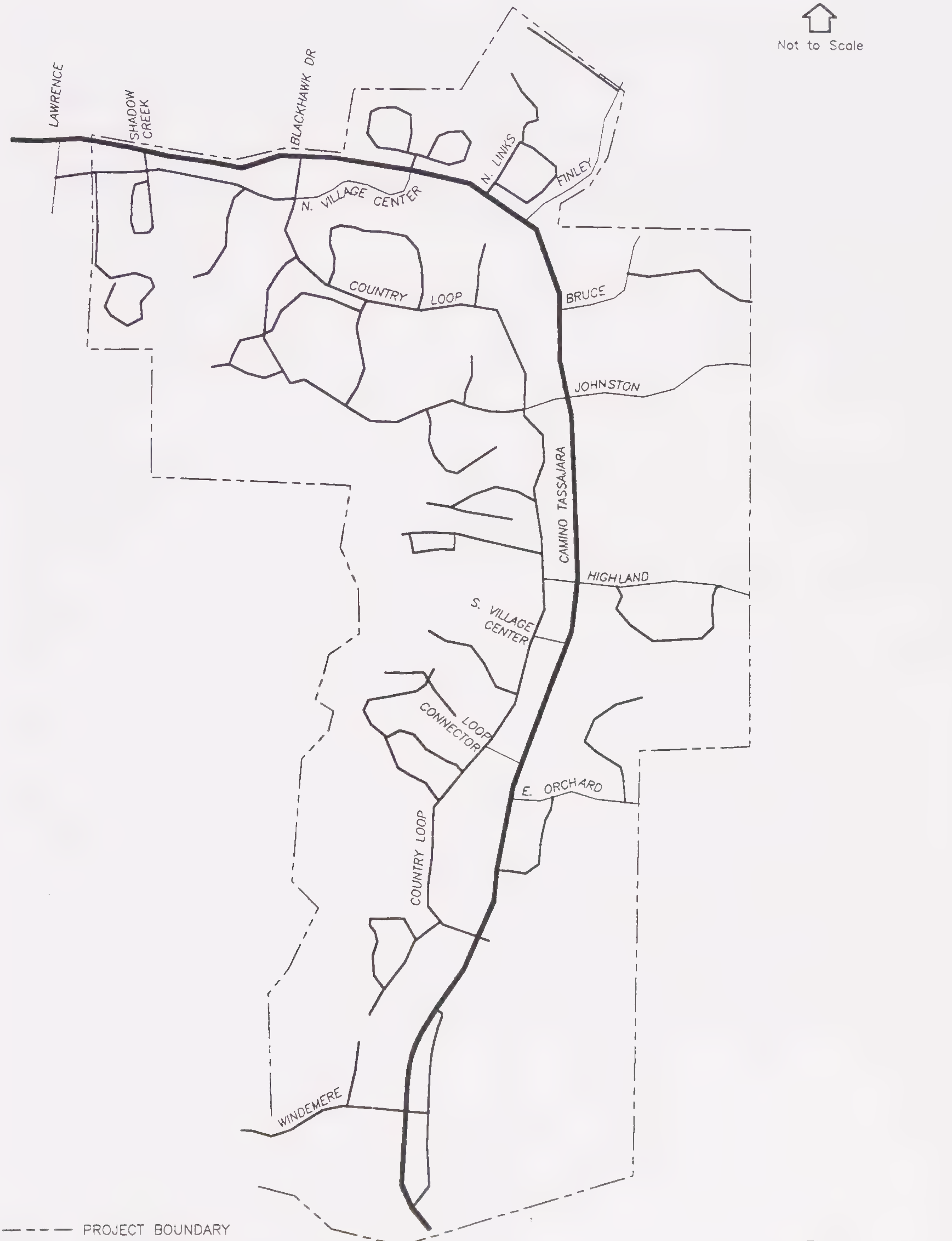

Figure 4.5-9

TASSAJARA ON-SITE ROADWAY SYSTEM

TABLE 4.5-6
PROJECT TRIP GENERATION

	AM Peak Hour	PM Peak Hour
Internal Trips	824	1,403
Outbound Trips	2,880	1,677
Inbound Trips	1,065	3,033
Total	**4,769**	**6,113**

The trip distribution pattern for project trips was calculated using the Tri-Valley model (Figure 4.5-10). Roughly one-half of the traffic (52 percent in AM, 55 percent in PM) would be oriented to/from the northwest in the Camino Tassajara corridor and one-half (46 percent in AM, 43 percent in PM) would be oriented to/from the south in the Camino Tassajara/Tassajara Road corridor. The traffic projections from the model show that fewer than two percent of project trips are expected to use Highland Road. Appendix C-III shows the forecasted 2010 traffic volumes with the project.

Project Traffic Impacts

Roadway and Intersection Impacts

Highland Road Operations

The off-site segment of Highland Road was analyzed using the *Highway Capacity Manual* methodology for analysis of rural roadways. The *Highway Capacity Manual* rural road operations analysis showed that Highland Road would operate at an acceptable LOS D or better during both peak hours under 2010 project conditions. The analysis computations are included in Appendix C-V.

Freeway Operations

Freeway operations were evaluated using V/C ratios for each of the 20 directional freeway segments. The results of the analysis are shown in Table 4.5-7.

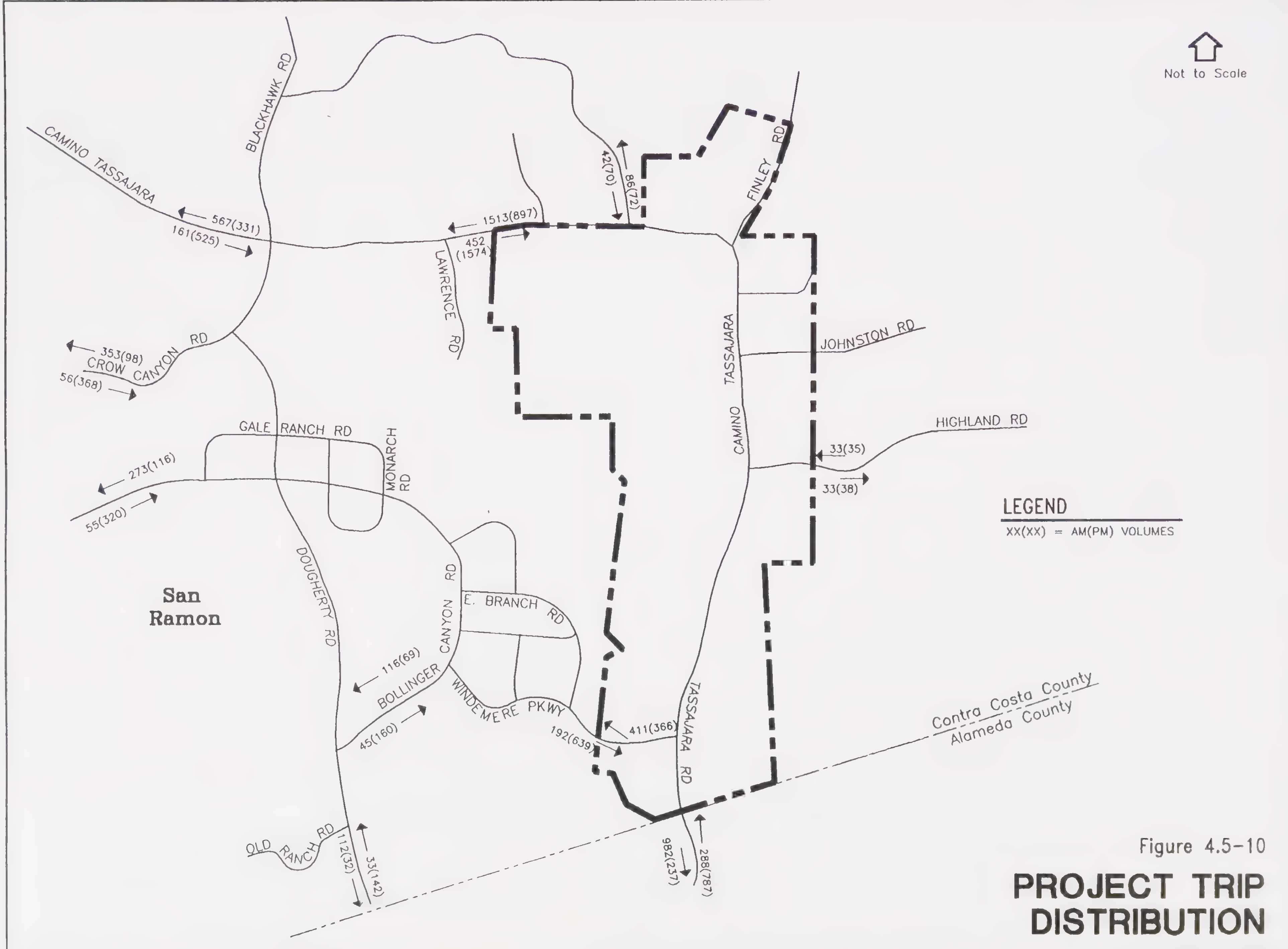

Figure 4.5-10

PROJECT TRIP DISTRIBUTION

TABLE 4.5-7
FREEWAY OPERATIONS UNDER 2010 CONDITIONS

					Without Project						With Project							
					AM Peak Hour			PM Peak Hour			AM Peak Hour				PM Peak Hour			
Roadway	Segment	Direction	HOV Lanes	Capacity	Volume	V/C	LOS	Volume	V/C	LOS	Volume	V/C	LOS	Impact	Volume	V/C	LOS	Impact
I-680	El Pintado to El Cerro	NB	Yes	6,600	6,680	1.01	F	6,160	0.93	E	6,860	1.04	F	YES	6190	0.94	E	NO
		SB	Yes	6,600	5,100	0.77	D	6,910	1.05	F	5,020	0.76	D	NO	6,730	1.02	F	NO
I-680	Sycamore to Crow Canyon	NB	Yes	7,700	6,110	0.79	D	6,070	0.79	D	6,140	0.80	E	NO	6,020	0.78	D	NO
		SB	Yes	7,700	5,000	0.65	D	6,180	0.80	E	4,880	0.63	D	NO	6,050	0.79	D	NO
I-680	Crow Canyon to Bollinger Canyon	NB	Yes	7,700	5,550	0.72	D	4,630	0.60	C	5,540	0.72	D	NO	4,620	0.60	C	NO
		SB	Yes	7,700	3,820	0.50	C	5,170	0.67	D	3,790	0.49	C	NO	5,010	0.65	D	NO
I-680	Alcosta to I-580	NB	No	6,600	6,160	0.93	E	4,950	0.75	D	6,110	0.93	E	NO	4,900	0.74	D	NO
		SB	No	6,600	4,030	0.61	C	5,450	0.83	E	4,020	0.61	C	NO	5,440	0.82	E	NO
I-680	West Las Positas to Bernal	NB	No	6,600	5,050	0.77	D	4,840	0.73	D	4,950	0.75	D	NO	4,880	0.74	D	NO
		SB	No	6,600	4,630	0.70	D	6,170	0.93	E	4,730	0.72	D	NO	6,010	0.91	E	NO
I-580	Schaffer Ranch to San Ramon	EB	No	9,900	4,340	0.44	C	8,210	0.83	E	4,220	0.43	C	NO	8,110	0.82	E	NO
		WB	No	9,900	8,510	0.86	E	5,720	0.58	C	8,570	0.87	E	NO	5,650	0.57	C	NO
I-580	Hopyard/Dougherty to Hacienda	EB	No	9,900	5,490	0.55	C	9,720	0.98	E	5,540	0.56	C	NO	9,770	0.99	E	NO
		WB	No	9,900	9,600	0.97	E	7,140	0.72	D	9,890	0.99	E	NO	7,130	0.72	D	NO
I-580	Hacienda to Santa Rita/Tassajara	EB	No	9,900	4,480	0.45	C	9,960	1.01	F	4,550	0.46	C	NO	10,080	1.02	F	YES
		WB	No	9,900	9,940	1.00	F	6,730	0.68	D	10,450	1.06	F	YES	6,750	0.68	D	NO

					Without Project						With Project							
					AM Peak Hour			PM Peak Hour			AM Peak Hour				PM Peak Hour			
Roadway	Segment	Direction	HOV Lanes	Capacity	Volume	V/C	LOS	Volume	V/C	LOS	Volume	V/C	LOS	Impact	Volume	V/C	LOS	Impact
I-580	El Charro/Fallon to Airway	EB	Yes	8,800	4,600	0.52	C	10,150	1.15	F	4,670	0.53	C	NO	10,180	1.16	F	YES
		WB	Yes	8,800	9,230	1.05	F	6,180	0.70	D	9,380	1.07	F	YES	6,220	0.71	D	NO
I-580	Vasco to Greenville	EB	No	8,800	2,780	0.32	B	7,810	0.89	E	2,780	0.32	B	NO	7,800	0.89	E	NO
		WB	No	8,800	7,700	0.88	E	2,970	0.34	B	7,770	0.88	E	NO	2,980	0.34	B	NO

Notes:

1 V/C standard is 0.99 for all freeway segments.

2 For HOV segments, HOV volumes and capacities are excluded from the calculation, that is, the volumes pertain to low-occupancy vehicles and the capacities pertain to mixed-flow (non-HOV) lanes only. For non-HOV segments, the volumes pertain to all vehicles and the capacities pertain to total capacity.

3 Project is partially responsible for all freeway impacts identified.

Source: Barton-Aschman, 1996.

Impact 4.5-1 The project would significantly affect traffic conditions on five of the twenty directional freeway segments.

The results show that the additional traffic generated by the project would cause an increase in the V/C ratio of five segments already operating at Level of Service F. These five segments are northbound I-680 from El Cerro Boulevard to El Pintado Road, eastbound and westbound I-580 from Hacienda Drive to Tassajara/Santa Rita Road, and eastbound and westbound I-580 from El Charro/Fallon Road to Airway Boulevard.

The *Tri-Valley Transportation Plan* includes a series of actions to ensure adequate levels of service on regional facilities, including the freeway system, through 2010. These include auxiliary lanes, high-occupancy vehicle lanes, interchange improvements, widening and extension of arterials, and regionwide ramp metering. The funding of these improvements relies, in part, on a regional traffic impact fee. The fee will assess new development for a portion of the cost of regional improvements in proportion to their impacts. An impact fee is in place to mitigate impacts to freeway segments in Contra Costa County. The TVTC is considering additional fees for regional impacts to freeway segments in Alameda County.

Mitigation Measure

4.5-1 The Tassajara project should contribute toward the cost of regional improvements as specified in the Tri-Valley Transportation Plan in proportion to its trip generation. The amount should be in accordance with the Tri-Valley Impact Fee, if enacted at the time of approval, or should be determined by County staff. The project is partially responsible for funding this measure.

Intersection Operations

As described previously, operations were evaluated using critical movement V/C ratios and corresponding level of service for the 77 study intersections. For the intersection of Crow Canyon Road and Camino Tassajara, operations were also evaluated on the basis of vehicle queuing at the intersection approaches. The vehicle queuing analysis is presented here first.

An evaluation of intersection queuing operations is not a typical component of a long-term transportation planning analysis. Because of circumstances unique to its location, a queuing analysis was, however, conducted for the intersection of Crow Canyon Road and Camino Tassajara. The queuing analysis is part of a focused traffic analysis that was conducted for the area near Tassajara Ranch Drive in the Town of Danville. The analysis is detailed in Appendix C-VIII.

Impact 4.5-2 The Tassajara development would significantly affect queue operations on the westbound approach of the intersection at Camino Tassajara and Crow Canyon Road.

Without the project, the estimated average vehicle queue length would be within the available storage capacity for all lane groups at the intersection of Camino Tassajara and Crow Canyon Road. With the project, however, the estimated average vehicle queue length would exceed the available storage capacity for the westbound left-turn lanes in the AM 15-minute peak period. The shortage of storage capacity for westbound left-turning vehicles would create a temporary spillback of vehicles onto the adjacent westbound through lane. The estimated average AM peak period queue of 475 feet for left-turn vehicles would extend out of the 310-foot turn pocket and into the adjacent through lane. The westbound queue is not, however, expected to spill back into the intersection at Tassajara Village Drive.

Mitigation Measure

4.5-2 Extend the existing westbound left-turn pockets from 310 feet to 475 feet at the intersection of Camino Tassajara and Crow Canyon Road. This improvement would require cutting into the existing median, removing landscaping within the median, and paving over a distance of approximately 165 feet. The project is solely responsible for funding this measure.

Project conditions at the 77 study intersections were analyzed on the basis of intersection level of service. The results are summarized in Table 4.5-8.

Impact 4.5-3 The project would significantly affect level of service at nine of the 77 intersections studied.

The results show that significant project impacts are expected at nine of the 77 intersections during at least one of the peak hours. (The level of service calculations are on file at the Contra Costa County Community Development Department, Fourth Floor, Martinez, California.)

Tassajara Road and Dublin Boulevard. This intersection would be significantly upgraded by 2010. The planned geometry calls for dual left-turn lanes and single right-turn lanes on all four approaches, with three through lanes on each of eastbound and westbound Dublin Boulevard and four through lanes on each of northbound and southbound Tassajara Road.

At this intersection, AM peak-hour traffic operations would deteriorate from LOS E, with V/C = 0.94 without the project, to LOS F, with V/C = 1.05 with the project. Traffic operations in the PM peak hour would deteriorate from LOS E, with V/C = 0.93 without the project, to LOS E, with V/C = 0.97 with the project. The project would thus create a significant impact at the intersection in both the AM and PM peak hours.

Alcosta Boulevard and Old Ranch Road. The geometry of this intersection is not expected to change by 2010. At this intersection, PM peak-hour traffic operations would deteriorate from LOS D, with V/C = 0.86 without the project, to LOS E, with V/C = 0.93 with the project. The project would thus create a significant impact at the intersection in the PM peak hour. Traffic operations in the AM peak hour would not be impacted by the project.

TABLE 4.5-8
INTERSECTION OPERATIONS UNDER 2010 CONDITIONS

	Intersection			Without Project				With Project				Impact?	
				AM Peak		PM Peak		AM Peak		PM Peak			
Node	North/South Street	East/West Street	Location	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
1107	Monarch Road	Bollinger Canyon	CC County	0.59	A	0.60	B	0.62	B	0.62	B		
1111	W. of Monarch	Bollinger Canyon	CC County	0.79	C	0.65	B	0.83	D	0.67	B		
1573	Tassajara Road	Dublin Blvd.	Alameda Co	0.94	E	0.93	E	1.05	F	0.97	E	P	P
1705	Alcosta Blvd.	Old Ranch Road	San Ramon	0.70	C	0.86	D	0.75	C	0.93	E		S
1743	I-680 NB Off-Ramp	Crow Canyon Road	San Ramon	0.65	B	0.64	B	0.64	B	0.65	B		
1744	Camino Ramon	Crow Canyon Road	San Ramon	0.95	E	0.75	C	0.95	E	0.78	C		
1760	San Ramon Valley	Crow Canyon Road	San Ramon	0.56	A	0.78	C	0.57	A	0.76	C		
1776	Alcosta Blvd.	Crow Canyon Road	San Ramon	0.60	B	0.58	A	0.64	B	0.60	B		
1777	Alcosta Blvd.	Norris Canyon	San Ramon	0.28	A	0.39	A	0.28	A	0.41	A		
1789	Alcosta Blvd.	Bollinger Canyon	San Ramon	0.78	C	0.90	E	0.79	C	0.92	E		P
3537	Bollinger Canyon	Crow Canyon	CC County	0.64	B	0.63	B	0.65	B	0.62	B		
3975	Dougherty/Hopyard Road	I-580 WB Off-Ramp	Dublin	0.69	B	0.86	D	0.71	C	0.87	D		
3977	Dougherty Road	Dublin Blvd.	Dublin	0.88	D	0.89	D	0.91	E	0.90	E	S	S
3984	Dougherty Road	Amador Valley	Dublin	0.72	C	0.77	C	0.74	C	0.79	C		
3985	Santa Rita Road	W. Las Positas	Pleasanton	0.65	B	0.97	E	0.64	B	0.96	E		
3987	Tassajara Road	Gleason Avenue	Alameda Co	0.52	A	0.52	A	0.63	B	0.54	A		
3988	Tassajara Road	I-580 WB Off-Ramp	Pleasanton	0.53	A	0.6	B	0.54	A	0.61	B		
3993	Hopyard/Dougherty Road	I-580 EB Off-Ramp	Pleasanton	0.57	A	0.72	C	0.56	A	0.70	C		
3997	Hopyard Road	W. Las Positas	Pleasanton	0.62	B	1.03	F	0.62	B	1.03	F		
4041	Santa Rita Road	I-580 EB Off-Ramp	Pleasanton	0.63	B	0.64	B	0.66	B	0.65	B		
4058	Santa Rita Road	Stoneridge Drive	Pleasanton	0.77	C	0.96	E	0.78	C	0.96	E		
5340	Camino Tassajara	Bruce Drive	CC County	0.35	A	0.37	A	0.15	A	0.20	A		
5341	Camino Tassajara	S. Village Center	CC County	—	—	—	—	0.31	A	0.30	A		
5811	Camino Tassajara	Windemere Pkwy	CC County	0.66	B	0.50	A	1.00	F	0.92	E	S	S
5901	Blackhawk Drive	Camino Tassajara	CC County	0.29	A	0.40	A	0.63	B	0.52	A		
5919	N. Links Road	Camino Tassajara	CC County	—	—	—	—	0.21	A	0.24	A		
5920	Bollinger Canyon	S. of E. Branch	CC County	0.41	A	0.51	A	0.43	A	0.54	A		
5921	Bollinger Canyon	E. Branch Road	CC County	0.35	A	0.51	A	0.40	A	0.53	A		
5943	Camino Tassajara	E. Orchard Road	CC County	—	—	—	—	0.36	A	0.35	A		

Table 4.5-8 *continued*

Intersection				Without Project				With Project				Impact?	
				AM Peak		PM Peak		AM Peak		PM Peak			
Node	North/South Street	East/West Street	Location	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
5978	N. Livermore Avenue	Isabel Pkwy	Alameda Co	0.38	A	0.53	A	0.37	A	0.48	A		
6001	Crow Canyon Road	Center Way	Danville	0.39	A	0.48	A	0.52	A	0.63	B		
6007	Tassajara Ranch	Camino Tassajara	Danville	0.56	A	0.39	A	0.80	D	0.60	B		
6366	Dougherty Valley	Bollinger (N)	CC County	0.66	B	0.85	D	0.73	C	0.89	D		
6370	Tassajara Road	Fallon Road	Alameda Co	0.44	A	0.49	A	0.48	A	0.62	B		
6410	I-680 SB Off-Ramp	Crow Canyon Road	San Ramon	0.77	C	0.54	A	0.78	C	0.55	A		
6437	Gleason Avenue	Dublin Blvd.	Alameda Co	0.64	B	0.65	B	0.64	B	0.64	B		
6993	Camino Tassajara	Country Loop	CC County	—	—	—	—	0.45	A	0.32	A		
6994	Camino Tassajara	Loop Connector	CC County	—	—	—	—	0.34	A	0.22	A		
6995	Camino Tassajara	Johnston Road	CC County	0.36	A	0.39	A	0.30	A	0.37	A		
7091	Crow Canyon Road	Tassajara Ranch	Danville	0.48	A	0.51	A	0.63	B	0.64	B		
7147	Shadow Creek	Camino Tassajara	CC County	0.33	A	0.25	A	0.74	C	0.64	B		
8249	San Ramon Valley	Sycamore Valley	Danville	0.45	A	0.73	C	0.47	A	0.74	C		
8250	I-680 SB Off-Ramp	Sycamore Valley	Danville	0.43	A	0.50	A	0.43	A	0.53	A		
8251	I-680 NB On-Ramp	Sycamore Valley	Danville	0.27	A	0.43	A	0.28	A	0.44	A		
8252	Camino Tassajara	Sycamore Valley	Danville	0.43	A	0.19	A	0.50	A	0.27	A		
8255	I-680 SB Off-Ramp	Bollinger Canyon	San Ramon	0.63	B	0.57	A	0.65	B	0.60	B		
8256	I-680 NB Off-Ramp	Bollinger Canyon	San Ramon	0.47	A	0.70	C	0.44	A	0.73	C		
8258	Crow Canyon Road	Camino Tassajara	Danville	0.75	C	0.67	B	0.98	E	0.96	E	S	S
8259	Dougherty Road	Crow Canyon Road	San Ramon	0.58	A	0.68	B	0.72	C	0.84	D		
8260	Dougherty Road	Old Ranch Road	San Ramon	0.64	B	0.50	A	0.71	C	0.55	A		
8265	Camino Tassajara	Highland Road	CC County	0.51	A	0.57	A	0.35	A	0.49	A		
8302	Hacienda Drive	I-580 EB ramp	Pleasanton	0.70	C	0.72	C	0.70	C	0.73	C		
8305	Hacienda Drive	I-580 WB ramp	Dublin	0.46	A	0.71	C	0.46	A	0.72	C		
8306	Hacienda Drive	Dublin Blvd.	Dublin	0.56	A	0.87	D	0.60	B	0.92	E		S
8363	Gale Ranch Road	Bollinger Canyon	CC County	0.54	A	0.54	A	0.56	A	0.57	A		
8364	Dougherty Road	Bollinger (S)	CC County	0.53	A	0.40	A	0.58	A	0.43	A		
8365	Bollinger Canyon	Windemere Pkwy	CC County	0.53	A	0.60	B	0.70	C	0.75	C		
8366	Bollinger Canyon	N. of E. Branch	CC County	0.49	A	0.50	A	0.53	A	0.56	A		
9100	Camino Ramon	Bollinger Canyon	San Ramon	0.89	D	0.76	C	0.91	E	0.79	C	S	
9101	Norris Canyon	Camino Ramon	San Ramon	0.40	A	0.39	A	0.41	A	0.38	A		

Table 4.5-8 *continued*

	Intersection			Without Project				With Project				Impact?	
				AM Peak		PM Peak		AM Peak		PM Peak			
Node	North/South Street	East/West Street	Location	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	AM	PM
9125	Alcosta Blvd.	Pine Valley	San Ramon	0.43	A	0.54	A	0.45	A	0.58	A		
9126	Finley Road	Camino Tassajara	CC County	0.38	A	0.40	A	0.16	A	0.21	A		
9129	N. Village Center	Camino Tassajara	CC County	—	—	—	—	0.31	A	0.33	A		
9150	Diablo Blvd.	Camino Tassajara	Danville	0.40	A	0.32	A	0.43	A	0.31	A		
9164	Green Valley	Diablo Blvd.	Danville	0.73	C	0.60	B	0.74	C	0.61	B		
9198	I-680 SB Off-Ramp	Diablo Road	Danville	0.51	A	0.34	A	0.52	A	0.34	A		
9204	I-680 NB Off-Ramp	Diablo Road	Danville	0.33	A	0.38	A	0.34	A	0.38	A		
9339	Camino Ramon	Executive Pkwy	San Ramon	0.48	A	0.54	A	0.49	A	0.55	A		
9340	Sunset Blvd.	Bollinger Canyon	San Ramon	0.87	D	0.89	D	0.86	D	0.91	E		S
9344	Crow Canyon Plaza	Crow Canyon Road	San Ramon	0.60	B	0.81	D	0.60	B	0.82	D		
9349	Lawrence Road	Camino Tassajara	CC County	0.37	A	0.71	C	0.63	B	0.67	B		
9355	Brookside	Sycamore Valley	Danville	0.55	A	0.31	A	0.61	B	0.35	A		
9357	San Ramon Valley	Railroad Avenue	Danville	0.43	A	0.56	A	0.44	A	0.56	A		
9414	El Capitan Drive	Crow Canyon Road	San Ramon	0.74	C	0.67	B	0.79	C	0.67	B		
9954	Fallon Road	Gleason Road	Alameda Co	0.46	A	0.54	A	0.50	A	0.57	A		
9956	Fallon/El Charro Road	I-580 WB ramp	Alameda Co	0.68	B	0.78	C	0.71	C	0.80	D		
9957	El Charro/Fallon Road	I-580 EB ramp	Alameda Co	0.41	A	0.47	A	0.40	A	0.47	A		

P and S denote that the impact is partially or solely attributable to the project.

Source: Barton-Aschman, 1996.

Alcosta Boulevard and Bollinger Canyon Road. A number of changes are planned for this intersection, the most significant of which would result from the widening of Bollinger Canyon Road from four to six lanes east of Alcosta Boulevard. In the PM peak hour, traffic operations at this intersection would deteriorate from LOS E, with V/C = 0.90 without the project, to LOS E, with V/C = 0.92 with the project. The project would thus create a significant impact at the intersection in the PM peak hour. Traffic operations in the AM peak hour would not be impacted by the project.

Dougherty Road and Dublin Boulevard. This intersection would be upgraded significantly by 2010. The most significant changes would result from the widenings of both Dougherty Road and Dublin Boulevard from four to six lanes. At this intersection, AM peak-hour traffic operations would deteriorate from LOS D, with V/C = 0.88 without the project, to LOS E, with V/C = 0.91 with the project. Traffic operations in the PM peak hour would deteriorate from LOS D, with V/C = 0.89 without the project, to LOS E, with V/C = 0.90 with the project. The project would thus create a significant impact at the intersection in both the AM and PM peak hours.

Camino Tassajara and Windemere Parkway. This intersection does not yet exist, but would be created with the construction of Windemere Parkway. In the AM peak hour, traffic operations at this intersection would deteriorate from LOS B, with V/C = 0.66 without the project, to LOS F, with V/C = 1.00 with the project. Traffic operations in the PM peak hour would deteriorate from LOS A, with V/C = 0.50 without the project, to LOS E, with V/C = 0.92 with the project. The project would thus create a significant impact at the intersection in both the AM and PM peak hours.

Crow Canyon Road and Camino Tassajara. Traffic operations in the AM peak-hour would deteriorate from LOS C, with V/C = 0.75 without the project, to LOS E, with V/C = 0.98 with the project. In the PM peak hour, traffic operations would deteriorate from LOS B, with V/C = 0.67 without the project, to LOS E, with V/C = 0.96 with the project. The project would thus create a significant impact at the intersection in both the AM and PM peak hours.

Hacienda Drive and Dublin Boulevard. This intersection would be upgraded significantly by 2010. The most significant changes would result from the widening of Dublin Boulevard from two lanes to six lanes at this location, the widening of Hacienda Drive from four lanes to six lanes south of Dublin Boulevard, and the four-lane extension of Hacienda Drive north of Dublin Boulevard. The intersection geometry would include dual left-turn lanes on all four approaches and dual right-turn lanes on the northbound and eastbound approaches.

At this intersection, PM peak-hour traffic operations would deteriorate from LOS D, with V/C = 0.87 without the project, to LOS E, with V/C = 0.92 with the project. The project would thus create a significant impact at the intersection in the PM peak hour. Traffic operations in the AM peak hour would not be impacted by the project.

Camino Ramon and Bollinger Canyon Road. The most significant change to this intersection will be the addition of a south leg to what is now only a T-intersection. At this intersection, AM peak-hour traffic operations would deteriorate from LOS D, with V/C = 0.89 without the project, to LOS E, with V/C = 0.91 with the project. The project would thus create a significant impact at the intersection in the AM peak hour. Traffic operations in the PM peak hour would not be impacted by the project.

Sunset Drive and Bollinger Canyon Road. The geometry of this intersection is not expected to change by 2010. In the PM peak hour, traffic operations at this intersection would deteriorate from LOS D, with V/C = 0.89 without the project, to LOS E, with V/C = 0.91 with the project. The project would thus create a significant impact at the intersection in the PM peak hour. Traffic operations in the AM peak hour would not be impacted by the project.

Mitigation Packages for Intersection Level of Service Impacts

Due to the magnitude and geographic scope of the traffic impacts, alternative mitigation strategies were investigated. The following sections describe three different mitigation packages for Impact 4.5-3. Any one of the three mitigation packages would reduce the project impacts on intersection level of service to a less-than-significant level. Therefore, only one of the three mitigation packages would need to be implemented.

The first mitigation package, Package A, consists of the implementation of isolated intersection improvements at each impacted intersection. The second mitigation package, Package B, entails a reduction in the project development level as well as implementation of intersection improvements at the corresponding impacted intersections. The third mitigation package, Package C, involves the extension of Shadow Creek Drive southward to connect to Bollinger Canyon Road as well as implementation of intersection improvements at the corresponding impacted intersections. Note that many of the intersection improvements are the same in all three packages. These measures that are common to all three packages are indicated with an asterisk (*) next to their number. Many of these measures may create secondary impacts at established intersections, such as visual/aesthetics, grading and noise and, if selected, could require additional environmental analysis. The extension of Shadow Creek Drive southward to Bollinger Canyon Road could have the greatest impact of the improvements. The secondary impact of this mitigation is summarized below, based upon a conceptual alignment.

Mitigation Measure 4.5-3

Package A: Conventional Intersection Improvements

Implementation of the following mitigation measures would reduce the level of service degradation of the nine intersections to a less-than-significant level.

4.5-3A-1 *[Tassajara/Dublin] Implement any one of (a), (b), or (c) below.*

(a) *Provide a triple eastbound left-turn lane, a triple westbound left-turn lane, and a free southbound right-turn lane at the intersection of Tassajara Road and Dublin Boulevard.*

(b) *Upgrade the planned Gleason Drive from a four-lane residential arterial (30 mph speed, 800 vphpl [vehicles per hour per lane] capacity) to a four-lane urban arterial (40 mph speed, 900 vphpl capacity) from Tassajara Road west to Dublin Boulevard.*

(c) Provide a grade-separated interchange at the intersection of Tassajara Road and Dublin Boulevard.

Any of (a), (b), or (c) could be integrated into plans for the area since all the land in the vicinity is currently vacant. The project is partially responsible for funding this measure.

4.5-3A-2 [Alcosta/Old Ranch] Convert the existing westbound shared through/right-turn lane to a right-turn-only lane at the intersection of Alcosta Boulevard and Old Ranch Road. This would require restriping the westbound shared through/right-turn lane. This can be accomplished within the existing curb-to-curb width. The project is solely responsible for funding this measure.*

4.5-3A-3 [Alcosta/Bollinger Canyon] Add a second westbound left-turn lane at the intersection of Alcosta Boulevard and Bollinger Canyon Road. This improvement could possibly be incorporated into the future six-lane design of Bollinger Canyon Road. The improvement could entail the acquisition of additional right-of-way. Implications of the improvement would depend on the extent to which the improvement could be accommodated within the Bollinger Canyon Road widening project. This proposed measure needs to be supported with more detail before it can be considered viable (Dillon, 1996). The additional detail cannot currently be provided because the future intersection layout, under the six-lane Bollinger Road plan, is currently unavailable. The project is partially responsible for funding this measure.*

4.5-3A-4 [Dougherty/Dublin] Add a fourth southbound through lane at the intersection of Dougherty Road and Dublin Boulevard. This improvement could possibly be incorporated in the planned Dougherty Road widening project. Still, the improvement is likely to entail the acquisition of additional right-of-way. Other requirements of the improvement could include removing or relocating one or both corner service stations, removing and replacing curb and gutter and sidewalk, paving, removing landscaping, and relocating signal poles along southbound Dougherty Road on the near and far sides of the intersection. The project is solely responsible for funding this measure.

4.5-3A-5 [Camino Tassajara/Windemere] Add a second northbound left-turn lane at the intersection of Camino Tassajara and Windemere Parkway. This could be integrated into plans for the area since all the land in the vicinity is currently vacant. The project is solely responsible for funding this measure.*

4.5-3A-6 [Crow Canyon/Camino Tassajara] Implement either (a) or (b) below.

a) Convert the eastbound exclusive right-turn lane into a free right-turn lane, convert the northbound shared through/right-turn lane into a through-only lane, and convert the northbound exclusive right-turn lane into a free right-turn lane at the intersection of Crow Canyon Road and Camino Tassajara. These

improvements would require: 1) installing a pork-chop island on the southwest corner, 2) restriping the existing northbound shared through/right-turn lane, 3) installing a pork-chop island on the southeast corner, and 4) eliminating the shopping center access from eastbound Camino Tassajara at the first driveway on the far side of the intersection and possibly at the Tassajara Village Drive intersection (in order to allow adequate weaving distance for northbound free-right-turning vehicles and eastbound through vehicles).

b) Convert the eastbound exclusive right-turn lane into a free right-turn lane, convert the northbound shared through/right-turn lane into a through-only lane, and add a second northbound right-turn lane at the intersection of Crow Canyon Road and Camino Tassajara. These improvements would require: 1) installing a pork-chop island on the southwest corner, 2) restriping the existing northbound shared through/right-turn lane, 3) acquiring right-of-way, removing and replacing curb and gutter and sidewalk, paving, relocating the signal pole, and removing landscaping along northbound Crow Canyon Road on the near side of the intersection.

The project is solely responsible for funding this measure.

4.5-3A-7 [Hacienda/Dublin] Provide a separate signal phase for northbound right-turns at the intersection of Hacienda Drive and Dublin Boulevard. This could be integrated into plans for the intersection since the intersection is not yet upgraded to the ultimate 2010 design. The project is solely responsible for funding this measure.*

4.5-3A-8 [Camino Ramon/Bollinger] Convert the westbound shared through/right-turn lane into an exclusive right-turn lane at the intersection of Camino Ramon and Bollinger Canyon Road. This improvement would require restriping the westbound shared through/right-turn lane. The project is solely responsible for funding this measure.*

4.5-3A-9 [Sunset/Bollinger] Convert the southbound shared through/left-turn lane to an exclusive left-turn lane, convert the southbound inner right-turn lane into a shared through/left-turn lane, and convert the southbound outer (shoulder) right-turn lane into a free right-turn lane at the intersection of Sunset Drive and Bollinger Canyon Road (Korve, 1994). These improvements would require (1) reconstructing curb, gutter, and sidewalk, repaving and restriping on the southbound approach of Sunset on the near side of the intersection, (2) removing and reconstructing curb and gutter on westbound Bollinger Canyon Road at far side of intersection, (3) relocating signal pole and reconstructing pork-chop island at northwest corner of intersection, and (4) modifying traffic signal. The project is solely responsible for funding this measure.*

Intersection operations under 2010 project conditions with implementation of Mitigation Measure 4.5-3 Package A are summarized in Table 4.5-9.

TABLE 4.5-9
INTERSECTION OPERATIONS UNDER 2010 PROJECT CONDITIONS WITH MITIGATION PACKAGE A

	Intersection			Project Unmitigated				Impact?		Project With Mitigations			
				AM Peak		PM Peak				AM Peak		PM Peak	
Node	North/South Street	East/West Street	Location	V/C	LOS	V/C	LOS	AM	PM	V/C	LOS	V/C	LOS
1107	Monarch Road	Bollinger Canyon	CC County	0.62	B	0.62	B			0.62	B	0.62	B
1111	W. of Monarch	Bollinger Canyon	CC County	0.83	D	0.67	B			0.83	D	0.67	B
1573	Tassajara Road	Dublin Blvd.	Alameda Co	1.05	F	0.97	E	P	P	0.89	D	0.88	D
1705	Alcosta Blvd.	Old Ranch Road	San Ramon	0.75	C	0.93	E		S	0.51	A	0.66	B
1743	I-680 NB Off-Ramp	Crow Canyon Road	San Ramon	0.64	B	0.65	B			0.64	B	0.65	B
1744	Camino Ramon	Crow Canyon Road	San Ramon	0.95	E	0.78	C			0.95	E	0.78	C
1760	San Ramon Valley	Crow Canyon Road	San Ramon	0.57	A	0.76	C			0.57	A	0.76	C
1776	Alcosta Blvd.	Crow Canyon Road	San Ramon	0.64	B	0.60	B			0.64	B	0.60	B
1777	Alcosta Blvd.	Norris Canyon	San Ramon	0.28	A	0.41	A			0.28	A	0.41	A
1789	Alcosta Blvd.	Bollinger Canyon	San Ramon	0.79	C	0.92	E		P	0.79	C	0.89	D
3537	Bollinger Canyon	Crow Canyon	CC County	0.65	B	0.62	B			0.65	B	0.62	B
3975	Dougherty/Hopyard Road	I-580 WB Off-Ramp	Dublin	0.71	C	0.87	D			0.71	C	0.87	D
3977	Dougherty Road	Dublin Blvd.	Dublin	0.91	E	0.90	E	S	S	0.84	D	0.86	D
3984	Dougherty Road	Amador Valley	Dublin	0.74	C	0.79	C			0.74	C	0.79	C
3985	Santa Rita Road	W. Las Positas	Pleasanton	0.64	B	0.96	E			0.64	B	0.96	E
3987	Tassajara Road	Gleason Avenue	Alameda Co	0.63	B	0.54	A			0.63	B	0.54	A
3988	Tassajara Road	I-580 WB Off-Ramp	Pleasanton	0.54	A	0.61	B			0.54	A	0.61	B
3993	Hopyard/Dougherty Road	I-580 EB Off-Ramp	Pleasanton	0.56	A	0.70	C			0.56	A	0.70	C
3997	Hopyard Road	W. Las Positas	Pleasanton	0.62	B	1.03	F			0.62	B	1.03	F
4041	Santa Rita Road	I-580 EB Off-Ramp	Pleasanton	0.66	B	0.65	B			0.66	B	0.65	B
4058	Santa Rita Road	Stoneridge Drive	Pleasanton	0.78	C	0.96	E			0.78	C	0.96	E
5340	Camino Tassajara	Bruce Drive	CC County	0.15	A	0.20	A			0.15	A	0.20	A
5341	Camino Tassajara	S. Village Center	CC County	0.31	A	0.30	A			0.31	A	0.30	A
5811	Camino Tassajara	Windemere Pkwy	CC County	1.00	F	0.92	E	S	S	0.75	C	0.67	B
5901	Blackhawk Drive	Camino Tassajara	CC County	0.63	B	0.52	A			0.63	B	0.52	A
5919	N. Links Road	Camino Tassajara	CC County	0.21	A	0.24	A			0.21	A	0.24	A
5920	Bollinger Canyon	S. of E. Branch	CC County	0.43	A	0.54	A			0.43	A	0.54	A
5921	Bollinger Canyon	E. Branch Road	CC County	0.40	A	0.53	A			0.40	A	0.53	A
5943	Camino Tassajara	E. Orchard Road	CC County	0.36	A	0.35	A			0.36	A	0.35	A
5978	N. Livermore Avenue	Isabel Pkwy	Alameda Co	0.37	A	0.48	A			0.37	A	0.48	A

Table 4.5-9 *continued*

	Intersection			Project Unmitigated				Impact?		Project With Mitigations			
				AM Peak		PM Peak				AM Peak		PM Peak	
Node	North/South Street	East/West Street	Location	V/C	LOS	V/C	LOS	AM	PM	V/C	LOS	V/C	LOS
6001	Crow Canyon Road	Center Way	Danville	0.52	A	0.63	B			0.52	A	0.63	B
6007	Tassajara Ranch	Camino Tassajara	Danville	0.80	D	0.60	B			0.80	D	0.60	B
6366	Dougherty Valley	Bollinger (N)	CC County	0.73	C	0.89	D			0.73	C	0.89	D
6370	Tassajara Road	Fallon Road	Alameda Co	0.48	A	0.62	B			0.48	A	0.62	B
6410	I-680 SB Off-Ramp	Crow Canyon Road	San Ramon	0.78	C	0.55	A			0.78	C	0.55	A
6437	Gleason	Dublin Blvd.	Alameda Co	0.64	B	0.64	B			0.64	B	0.64	B
6993	Camino Tassajara	Country Loop	CC County	0.45	A	0.32	A			0.45	A	0.32	A
6994	Camino Tassajara	Loop Connector	CC County	0.34	A	0.22	A			0.34	A	0.22	A
6995	Camino Tassajara	Johnston Road	CC County	0.30	A	0.37	A			0.30	A	0.37	A
7091	Crow Canyon Road	Tassajara Ranch	Danville	0.63	B	0.64	B			0.63	B	0.64	B
7147	Shadow Creek	Camino Tassajara	CC County	0.74	C	0.64	B			0.74	C	0.64	B
8249	San Ramon Valley	Sycamore Valley	Danville	0.47	A	0.74	C			0.47	A	0.74	C
8250	I-680 SB Off-Ramp	Sycamore Valley	Danville	0.43	A	0.53	A			0.43	A	0.53	A
8251	I-680 NB On-Ramp	Sycamore Valley	Danville	0.28	A	0.44	A			0.28	A	0.44	A
8252	Camino Tassajara	Sycamore Valley	Danville	0.50	A	0.27	A			0.50	A	0.27	A
8255	I-680 SB Off-Ramp	Bollinger Canyon	San Ramon	0.65	B	0.60	B			0.65	B	0.60	B
8256	I-680 NB Off-Ramp	Bollinger Canyon	San Ramon	0.44	A	0.73	C			0.44	A	0.73	C
8258	Crow Canyon Road	Camino Tassajara	Danville	0.98	E	0.96	E	S	S	0.89	D	0.85	D
8259	Dougherty Road	Crow Canyon Road	San Ramon	0.72	C	0.84	D			0.72	C	0.84	D
8260	Dougherty Road	Old Ranch Road	San Ramon	0.71	C	0.55	A			0.71	C	0.55	A
8265	Camino Tassajara	Highland Road	CC County	0.35	A	0.49	A			0.35	A	0.49	A
8302	Hacienda Drive	I-580 EB ramp	Pleasanton	0.70	C	0.73	C			0.70	C	0.73	C
8305	Hacienda Drive	I-580 WB ramp	Dublin	0.46	A	0.72	C			0.46	A	0.72	C
8306	Hacienda Drive	Dublin Blvd.	Dublin	0.60	B	0.92	E		S	0.60	B	0.88	D
8363	Gale Ranch Road	Bollinger Canyon	CC County	0.56	A	0.57	A			0.56	A	0.57	A
8364	Dougherty Road	Bollinger (S)	CC County	0.58	A	0.43	A			0.58	A	0.43	A
8365	Bollinger Canyon	Windemere Pkwy	CC County	0.70	C	0.75	C			0.70	C	0.75	C
8366	Bollinger Canyon	N. of E. Branch	CC County	0.53	A	0.56	A			0.53	A	0.56	A
9100	Camino Ramon	Bollinger Canyon	San Ramon	0.91	E	0.79	C	S		0.87	D	0.79	C
9101	Norris Canyon	Camino Ramon	San Ramon	0.41	A	0.38	A			0.41	A	0.38	A
9125	Alcosta Blvd.	Pine Valley	San Ramon	0.45	A	0.58	A			0.45	A	0.58	A
9126	Finley Road	Camino Tassajara	CC County	0.16	A	0.21	A			0.16	A	0.21	A

Table 4.5-9 *continued*

	Intersection			Project Unmitigated				Impact?		Project With Mitigations			
				AM Peak		PM Peak				AM Peak		PM Peak	
Node	North/South Street	East/West Street	Location	V/C	LOS	V/C	LOS	AM	PM	V/C	LOS	V/C	LOS
9129	N. Village Center	Camino Tassajara	CC County	0.31	A	0.33	A			0.31	A	0.33	A
9150	Diablo Blvd.	Camino Tassajara	Danville	0.43	A	0.31	A			0.43	A	0.31	A
9164	Green Valley	Diablo Blvd.	Danville	0.74	C	0.61	B			0.74	C	0.61	B
9198	I-680 SB Off-Ramp	Diablo Road	Danville	0.52	A	0.34	A			0.52	A	0.34	A
9204	I-680 NB Off-Ramp	Diablo Road	Danville	0.34	A	0.38	A			0.34	A	0.38	A
9339	Camino Ramon	Executive Pkwy	San Ramon	0.49	A	0.55	A			0.49	A	0.55	A
9340	Sunset Blvd.	Bollinger Canyon	San Ramon	0.86	D	0.91	E		S	0.86	D	0.61	D
9344	Crow Canyon Plaza	Crow Canyon Road	San Ramon	0.60	B	0.82	D			0.60	B	0.82	D
9349	Lawrence Road	Camino Tassajara	CC County	0.63	B	0.67	B			0.63	B	0.67	B
9355	Brookside	Sycamore Valley	Danville	0.61	B	0.35	A			0.61	B	0.35	A
9357	San Ramon Valley	Railroad Avenue	Danville	0.44	A	0.56	A			0.44	A	0.56	A
9414	El Capitan Drive	Crow Canyon Road	San Ramon	0.79	C	0.67	B			0.79	C	0.67	B
9954	Fallon Road	Gleason Road	Alameda Co	0.50	A	0.57	A			0.50	A	0.57	A
9956	Fallon/El Charro Road	I-580 WB ramp	Alameda Co	0.71	C	0.80	D			0.71	C	0.80	D
9957	El Charro/Fallon Road	I-580 EB ramp	Alameda Co	0.40	A	0.47	A			0.40	A	0.47	A

P and S denote that the impact is partially or solely attributable to the project.

Source: Barton-Aschman, 1996.

Package B: Reduced Project Development

Implementation of the following mitigation measures would reduce the project impacts on intersection level of service to a less-than-significant level.

4.5-3B-1 *Reduce project development to 3,662 dwelling units, with subareas 1, 2, 3, and 4 comprising 846, 1,941, 776, and 99 units, respectively. The project is solely responsible for implementing this measure.*

4.5-3B-2 *[Tassajara/Dublin] Implement any one of (a), (b), or (c) below.*

(a) *Provide a triple eastbound left-turn lane and a triple westbound left-turn lane at the intersection of Tassajara Road and Dublin Boulevard.*

(b) *Upgrade the planned Gleason Drive from a four-lane residential arterial (30 mph speed, 800 vphpl capacity) to a four-lane urban arterial (40 mph speed, 900 vphpl capacity) from Tassajara Road west to Dublin Boulevard.*

(c) *Provide a grade-separated interchange at the intersection of Tassajara Road and Dublin Boulevard.*

Any of (a), (b), or (c) could be integrated into plans for the area since all the land in the vicinity is currently vacant. The project is partially responsible for funding this measure.

*4.5-3B-3** *[Alcosta/Old Ranch] Convert the existing westbound shared through/right-turn lane to a right-turn-only lane at the intersection of Alcosta Boulevard and Old Ranch Road. This would require restriping the westbound shared through/right-turn lane. This can be accomplished within the existing curb-to-curb width. The project is solely responsible for funding this measure.*

*4.5-3B-4** *[Alcosta/Bollinger Canyon] Add a second westbound left-turn lane at the intersection of Alcosta Boulevard and Bollinger Canyon Road. This improvement could possibly be incorporated into the future six-lane design of Bollinger Canyon Road. The improvement could entail the acquisition of additional right-of-way. Implications of the improvement would depend on the extent to which the improvement could be accommodated within the Bollinger Canyon Road widening project. This proposed measure needs to be supported with more detail before it can be considered viable (Dillon, 1996). The additional detail cannot currently be provided because the future intersection layout, under the six-lane Bollinger Road plan, is currently unavailable. The project is partially responsible for funding this measure.*

4.5-3B-5 *[Dougherty/Dublin] Implement either (a) or (b) below.*

(a) Add a fourth southbound through lane at the intersection of Dougherty Road and Dublin Boulevard. This improvement could possibly be incorporated in the planned Dougherty Road widening project. Still, the improvement is likely to entail the acquisition of additional right-of-way. Other requirements of the improvement could include removing or relocating one or both corner service stations, removing and replacing curb and gutter and sidewalk, paving, removing landscaping, and relocating signal poles along southbound Dougherty Road on the near and far sides of the intersection.

(b) Add a third westbound left-turn lane at the intersection of Dougherty Road and Dublin Boulevard. This improvement could possibly be incorporated in the planned Dublin Boulevard widening project. The improvement could entail acquiring additional right-of-way, removing and replacing curb and gutter and sidewalk, and paving westbound Dublin Boulevard on the near side of the intersection.

The project is solely responsible for funding this measure.

*4.5-3B-6** *[Camino Tassajara/Windemere] Add a second northbound left-turn lane at the intersection of Camino Tassajara and Windemere Parkway. This could be integrated into plans for the area since all the land in the vicinity is currently vacant. The project is solely responsible for funding this measure.*

*4.5-3B-7** *[Hacienda/Dublin] Provide a separate signal phase for northbound right-turns at the intersection of Hacienda Drive and Dublin Boulevard. This could be integrated into plans for the intersection since the intersection is not yet upgraded to the ultimate 2010 design. The project is solely responsible for funding this measure.*

*4.5-3B-8** *[Camino Ramon/Bollinger] Convert the westbound shared through/right-turn lane into an exclusive right-turn lane at the intersection of Camino Ramon and Bollinger Canyon Road. This improvement would require restriping the westbound shared through/right-turn lane. The project is solely responsible for funding this measure.*

*4.5-3B-9** *[Sunset/Bollinger] Convert the southbound shared through/left-turn lane to an exclusive left-turn lane, convert the southbound inner right-turn lane into a shared through/left-turn lane, and convert the southbound outer (shoulder) right-turn lane into a free right-turn lane at the intersection of Sunset Drive and Bollinger Canyon Road (Korve, 1994). These improvements would require (1) reconstructing curb, gutter, and sidewalk, repaving and restriping on the southbound approach of Sunset on the near side of the intersection, (2) removing and reconstructing curb and gutter on westbound Bollinger Canyon Road at far side of intersection, (3) relocating signal pole and reconstructing pork-chop island at northwest corner of intersection, and (4) modifying traffic signal. The project is solely responsible for funding this measure.*

Under Mitigation Package B, the reduced-project-development land use would differ from the proposed (full-development) project land use only in that the number of households in project subarea 1 would be reduced from 3,385 to 846 dwelling units (Figure 4.5-11). The number of jobs in subarea 1 would remain the same, at 218. In project subareas 2, 3, and 4, the number of households and jobs would be the same for the reduced-project-development scenario as it would be under the proposed (full-development) project levels. Thus, the reduced project as identified in mitigation measure 4.5-3B-1 would comprise 3,662 dwelling units and 582 jobs. Beyond the project site, the land uses would be the same as the 2010 background land uses detailed previously in Table 4.5-3.

In order to ascertain the effects of the reduction in project development (mitigation measure 4.5-3B-1), it was necessary to rerun the traffic model. The change in project land use would affect the project traffic assignment which in turn could affect operations at the 77 study intersections. Evaluation of intersection operations under 2010 conditions with reduced project development revealed that 8 of the 77 study intersections would be impacted by the project. Implementation of the intersection improvements identified in mitigation measures 4.5-3B-2 through 4.5-3B-9 would mitigate these impacts.

Intersection operations under 2010 project conditions with implementation of Mitigation Measure 4.5-3 Package B are summarized in Table 4.5-10.

Package C: Shadow Creek Drive South Extension

Implementation of the following mitigation measures would reduce the project impacts on intersection level of service to a less-than-significant level.

4.5-3C-1 *Extend Shadow Creek Drive southward to connect to Bollinger Canyon Road in Dougherty Valley and extend Johnston Road westward to connect to the Shadow Creek Drive extension. The project is solely responsible for funding this measure.*

4.5-3C-2 *[Tassajara/Dublin] Implement any one of (a), (b), or (c) below.*

(a) *Provide a triple eastbound left-turn lane, a triple westbound left-turn lane, and a free southbound right-turn lane at the intersection of Tassajara Road and Dublin Boulevard.*

(b) *Upgrade the planned Gleason Drive from a four-lane residential arterial (30 mph speed, 800 vphpl capacity) to a four-lane urban arterial (40 mph speed, 900 vphpl capacity) from Tassajara Road west to Dublin Boulevard.*

(c) *Provide a grade-separated interchange at the intersection of Tassajara Road and Dublin Boulevard.*

Any of (a), (b), or (c) could be integrated into plans for the area since all the land in the vicinity is currently vacant. The project is partially responsible for funding this measure.

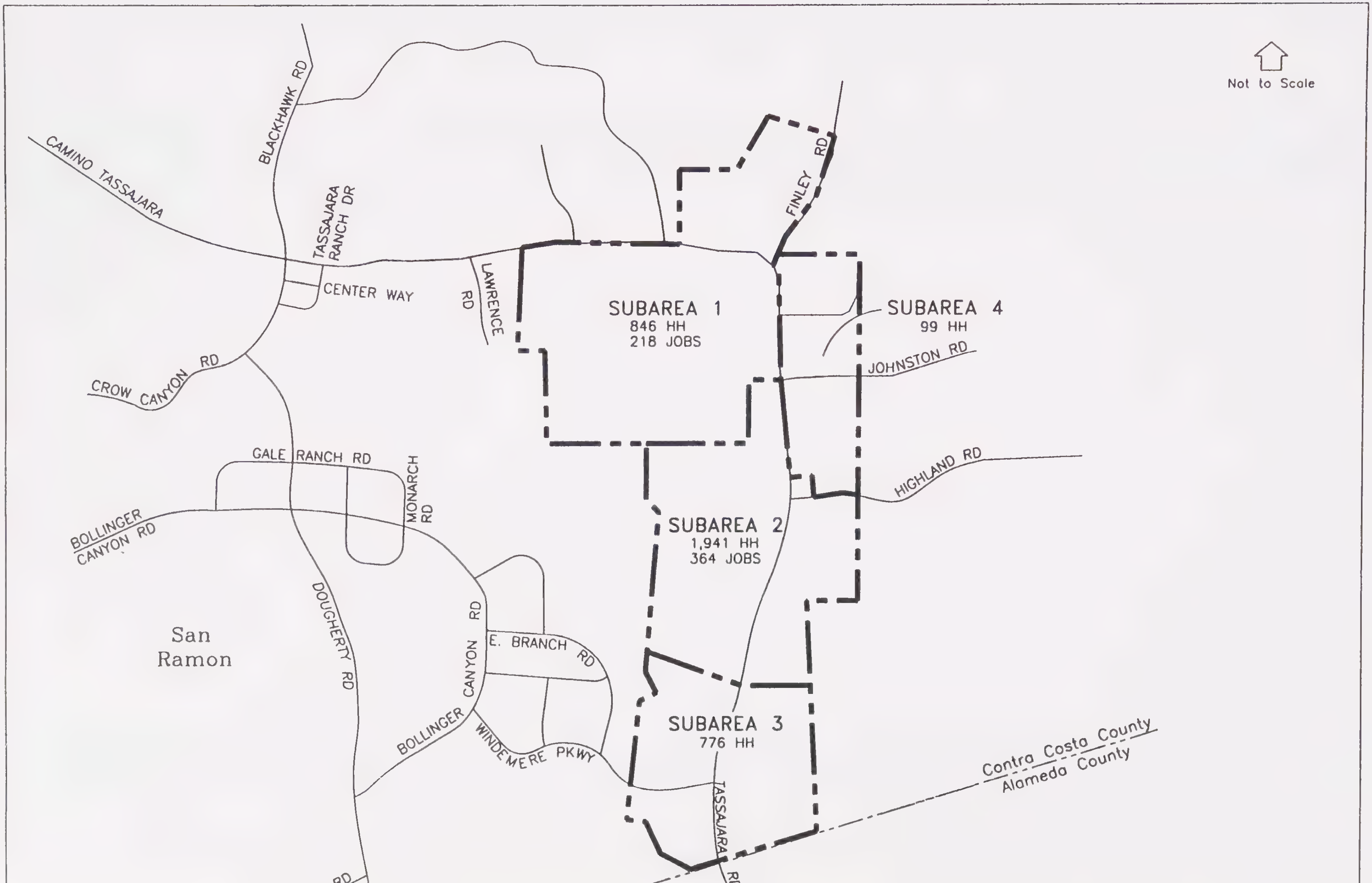

Figure 4.5-11

MITIGATION MEASURE 4.5-3
PACKAGE B LAND USES

TABLE 4.5-10
INTERSECTION OPERATIONS UNDER 2010 PROJECT CONDITIONS WITH MITIGATION PACKAGE B

	Intersection			Project Unmitigated				Impact?		Project With Mitigations			
				AM Peak		PM Peak				AM Peak		PM Peak	
Node	North/South Street	East/West Street	Location	V/C	LOS	V/C	LOS	AM	PM	V/C	LOS	V/C	LOS
1107	Monarch Road	Bollinger Canyon	CC County	0.62	B	0.62	B			0.62	B	0.62	B
1111	W. of Monarch	Bollinger Canyon	CC County	0.83	D	0.67	B			0.82	D	0.67	B
1573	Tassajara Road	Dublin Blvd.	Alameda Co	1.05	F	0.97	E	P	P	0.88	D	0.89	D
1705	Alcosta Blvd.	Old Ranch Road	San Ramon	0.75	C	0.93	E		S	0.51	A	0.65	B
1743	I-680 NB Off-Ramp	Crow Canyon Road	San Ramon	0.64	B	0.65	B			0.65	B	0.64	B
1744	Camino Ramon	Crow Canyon Road	San Ramon	0.95	E	0.78	C			0.93	E	0.76	C
1760	San Ramon Valley	Crow Canyon Road	San Ramon	0.57	A	0.76	C			0.57	A	0.76	C
1776	Alcosta Blvd.	Crow Canyon Road	San Ramon	0.64	B	0.60	B			0.61	B	0.59	A
1777	Alcosta Blvd.	Norris Canyon	San Ramon	0.28	A	0.41	A			0.28	A	0.39	A
1789	Alcosta Blvd.	Bollinger Canyon	San Ramon	0.79	C	0.92	E		P	0.79	C	0.87	D
3537	Bollinger Canyon	Crow Canyon	CC County	0.65	B	0.62	B			0.64	B	0.62	B
3975	Dougherty/Hopyard Road	I-580 WB Off-Ramp	Dublin	0.71	C	0.87	D			0.75	C	0.87	D
3977	Dougherty Road	Dublin Blvd.	Dublin	0.91	E	0.9	E	S	S	0.81	D	0.86	D
3984	Dougherty Road	Amador Valley	Dublin	0.74	C	0.79	C			0.74	C	0.78	C
3985	Santa Rita Road	W. Las Positas	Pleasanton	0.64	B	0.96	E			0.64	B	0.96	E
3987	Tassajara Road	Gleason Avenue	Alameda Co	0.63	B	0.54	A			0.58	A	0.51	A
3988	Tassajara Road	I-580 WB Off-Ramp	Pleasanton	0.54	A	0.61	B			0.57	A	0.60	B
3993	Hopyard/Dougherty Road	I-580 EB Off-Ramp	Pleasanton	0.56	A	0.7	C			0.56	A	0.71	C
3997	Hopyard Road	W. Las Positas	Pleasanton	0.62	B	1.03	F			0.62	B	1.02	F
4041	Santa Rita Road	I-580 EB Off-Ramp	Pleasanton	0.66	B	0.65	B			0.64	B	0.65	B
4058	Santa Rita Road	Stoneridge Drive	Pleasanton	0.78	C	0.96	E			0.77	C	0.95	E
5340	Camino Tassajara	Bruce Drive	CC County	0.15	A	0.2	A			0.16	A	0.21	A
5341	Camino Tassajara	S. Village Center	CC County	0.31	A	0.30	A			0.22	A	0.21	A
5811	Camino Tassajara	Windemere Pkwy	CC County	1.00	F	0.92	E	S	S	0.67	B	0.62	B
5901	Blackhawk Drive	Camino Tassajara	CC County	0.63	B	0.52	A			0.41	A	0.39	A
5919	N. Links Road	Camino Tassajara	CC County	0.21	A	0.24	A			0.19	A	0.24	A
5920	Bollinger Canyon	S. of E. Branch	CC County	0.43	A	0.54	A			0.43	A	0.54	A
5921	Bollinger Canyon	E. Branch Road	CC County	0.40	A	0.53	A			0.39	A	0.52	A
5943	Camino Tassajara	E. Orchard Road	CC County	0.36	A	0.35	A			0.28	A	0.28	A

Table 4.5-10 *continued*

Intersection				Project Unmitigated				Impact?		Project With Mitigations			
				AM Peak		PM Peak				AM Peak		PM Peak	
Node	North/South Street	East/West Street	Location	V/C	LOS	V/C	LOS	AM	PM	V/C	LOS	V/C	LOS
5978	N. Livermore Avenue	Isabel Pkwy	Alameda Co	0.37	A	0.48	A			0.37	A	0.50	A
6001	Crow Canyon Road	Center Way	Danville	0.52	A	0.63	B			0.47	A	0.55	A
6007	Tassajara Ranch	Camino Tassajara	Danville	0.80	D	0.6	B			0.63	B	0.50	A
6366	Dougherty Valley	Bollinger (N)	CC County	0.73	C	0.89	D			0.70	C	0.88	D
6370	Tassajara Road	Fallon Road	Alameda Co	0.48	A	0.62	B			0.47	A	0.58	A
6410	I-680 SB Off-Ramp	Crow Canyon Road	San Ramon	0.78	C	0.55	A			0.77	C	0.54	A
6437	Gleason	Dublin Blvd.	Alameda Co	0.64	B	0.64	B			0.62	B	0.64	B
6993	Camino Tassajara	Country Loop	CC County	0.45	A	0.32	A			0.35	A	0.25	A
6994	Camino Tassajara	Loop Connector	CC County	0.34	A	0.22	A			0.25	A	0.20	A
6995	Camino Tassajara	Johnston Road	CC County	0.30	A	0.37	A			0.18	A	0.25	A
7091	Crow Canyon Road	Tassajara Ranch	Danville	0.63	B	0.64	B			0.56	A	0.58	A
7147	Shadow Creek	Camino Tassajara	CC County	0.74	C	0.64	B			0.44	A	0.41	A
8249	San Ramon Valley	Sycamore Valley	Danville	0.47	A	0.74	C			0.45	A	0.73	C
8250	I-680 SB Off-Ramp	Sycamore Valley	Danville	0.43	A	0.53	A			0.43	A	0.52	A
8251	I-680 NB On-Ramp	Sycamore Valley	Danville	0.28	A	0.44	A			0.28	A	0.42	A
8252	Camino Tassajara	Sycamore Valley	Danville	0.50	A	0.27	A			0.45	A	0.22	A
8255	I-680 SB Off-Ramp	Bollinger Canyon	San Ramon	0.65	B	0.60	B			0.64	B	0.61	B
8256	I-680 NB Off-Ramp	Bollinger Canyon	San Ramon	0.44	A	0.73	C			0.44	A	0.71	C
8258	Crow Canyon Road	Camino Tassajara	Danville	0.98	E	0.96	E	S	S	0.89	D	0.78	C
8259	Dougherty Road	Crow Canyon Road	San Ramon	0.72	C	0.84	D			0.67	B	0.76	C
8260	Dougherty Road	Old Ranch Road	San Ramon	0.71	C	0.55	A			0.70	C	0.54	A
8265	Camino Tassajara	Highland Road	CC County	0.35	A	0.49	A			0.29	A	0.43	A
8302	Hacienda Drive	I-580 EB ramp	Pleasanton	0.70	C	0.73	C			0.69	B	0.73	C
8305	Hacienda Drive	I-580 WB ramp	Dublin	0.46	A	0.72	C			0.48	A	0.71	C
8306	Hacienda Drive	Dublin Blvd.	Dublin	0.60	B	0.92	E		S	0.55	A	0.86	D
8363	Gale Ranch Road	Bollinger Canyon	CC County	0.56	A	0.57	A			0.55	A	0.55	A
8364	Dougherty Road	Bollinger (S)	CC County	0.58	A	0.43	A			0.57	A	0.42	A
8365	Bollinger Canyon	Windemere Pkwy	CC County	0.70	C	0.75	C			0.68	B	0.75	C
8366	Bollinger Canyon	N. of E. Branch	CC County	0.53	A	0.56	A			0.53	A	0.55	A
9100	Camino Ramon	Bollinger Canyon	San Ramon	0.91	E	0.79	C	S		0.87	D	0.78	C
9101	Norris Canyon	Camino Ramon	San Ramon	0.41	A	0.38	A			0.40	A	0.38	A

Table 4.5-10 *continued*

Intersection				Project Unmitigated				Impact?		Project With Mitigations			
				AM Peak		PM Peak				AM Peak		PM Peak	
Node	North/South Street	East/West Street	Location	V/C	LOS	V/C	LOS	AM	PM	V/C	LOS	V/C	LOS
9125	Alcosta Blvd.	Pine Valley	San Ramon	0.45	A	0.58	A			0.44	A	0.57	A
9126	Finley Road	Camino Tassajara	CC County	0.16	A	0.21	A			0.17	A	0.22	A
9129	N. Village Center	Camino Tassajara	CC County	0.31	A	0.33	A			0.22	A	0.26	A
9150	Diablo Blvd.	Camino Tassajara	Danville	0.43	A	0.31	A			0.41	A	0.32	A
9164	Green Valley	Diablo Blvd.	Danville	0.74	C	0.61	B			0.73	C	0.60	B
9198	I-680 SB Off-Ramp	Diablo Road	Danville	0.52	A	0.34	A			0.52	A	0.35	A
9204	I-680 NB Off-Ramp	Diablo Road	Danville	0.34	A	0.38	A			0.33	A	0.38	A
9339	Camino Ramon	Executive Pkwy	San Ramon	0.49	A	0.55	A			0.48	A	0.54	A
9340	Sunset Blvd.	Bollinger Canyon	San Ramon	0.86	D	0.91	E		S	0.86	D	0.59	D
9344	Crow Canyon Plaza	Crow Canyon Road	San Ramon	0.60	B	0.82	D			0.60	B	0.82	D
9349	Lawrence Road	Camino Tassajara	CC County	0.63	B	0.67	B			0.43	A	0.47	A
9355	Brookside	Sycamore Valley	Danville	0.61	B	0.35	A			0.57	A	0.32	A
9357	San Ramon Valley	Railroad Avenue	Danville	0.44	A	0.56	A			0.43	A	0.55	A
9414	El Capitan Drive	Crow Canyon Road	San Ramon	0.79	C	0.67	B			0.76	C	0.67	B
9954	Fallon Road	Gleason Road	Alameda Co	0.50	A	0.57	A			0.49	A	0.56	A
9956	Fallon/El Charro Road	I-580 WB ramp	Alameda Co	0.71	C	0.80	D			0.65	B	0.79	C
9957	El Charro/Fallon Road	I-580 EB ramp	Alameda Co	0.40	A	0.47	A			0.38	A	0.48	A

P and S denote that the impact is partially or solely attributable to the project.

Source: Barton-Aschman, 1996.

*4.5-3C-3** *[Alcosta/Old Ranch] Convert the existing westbound shared through/right-turn lane to a right-turn-only lane at the intersection of Alcosta Boulevard and Old Ranch Road. This would require restriping the westbound shared through/right-turn lane. This can be accomplished within the existing curb-to-curb width. The project is solely responsible for funding this measure.*

*4.5-3C-4** *[Alcosta/Bollinger Canyon] Add a second westbound left-turn lane at the intersection of Alcosta Boulevard and Bollinger Canyon Road. This improvement could possibly be incorporated into the future six-lane design of Bollinger Canyon Road. The improvement could entail the acquisition of additional right-of-way. Implications of the improvement would depend on the extent to which the improvement could be accommodated within the Bollinger Canyon Road widening project. This proposed measure needs to be supported with more detail before it can be considered viable (Dillon, 1996). The additional detail cannot currently be provided because the future intersection layout, under the six-lane Bollinger Road plan, is currently unavailable. The project is partially responsible for funding this measure.*

4.5-3C-5 *[Dougherty/Dublin] Add a fourth southbound through lane at the intersection of Dougherty Road and Dublin Boulevard. This improvement could possibly be incorporated in the planned Dougherty Road widening project. Still, the improvement is likely to entail the acquisition of additional right-of-way. Other requirements of the improvement could include removing or relocating one or both corner service stations, removing and replacing curb and gutter and sidewalk, paving, removing landscaping, and relocating signal poles along southbound Dougherty Road on the near and far sides of the intersection. The project is solely responsible for funding this measure.*

*4.5-3C-6** *[Camino Tassajara/Windemere] Add a second northbound left-turn lane at the intersection of Camino Tassajara and Windemere Parkway. This could be integrated into plans for the area since all the land in the vicinity is currently vacant. The project is solely responsible for funding this measure.*

*4.5-3C-7** *[Hacienda/Dublin] Provide a separate signal phase for northbound right-turns at the intersection of Hacienda Drive and Dublin Boulevard. This could be integrated into plans for the intersection since the intersection is not yet upgraded to the ultimate 2010 design. The project is solely responsible for funding this measure.*

*4.5-3C-8** *[Camino Ramon/Bollinger] Convert the westbound shared through/right-turn lane into an exclusive right-turn lane at the intersection of Camino Ramon and Bollinger Canyon Road. This improvement would require restriping the westbound shared through/right-turn lane. The project is solely responsible for funding this measure.*

*4.5-3C-9** *[Sunset/Bollinger] Convert the southbound shared through/left-turn lane to an exclusive left-turn lane, convert the southbound inner right-turn lane into a shared through/left-turn lane, and convert the southbound outer (shoulder) right-turn lane into a free right-turn lane at the intersection of Sunset Drive and Bollinger Canyon Road (Korve, 1994). These improvements would require (1) reconstructing curb, gutter, and sidewalk, repaving and restriping on the southbound approach of Sunset on the near side of the intersection, (2) removing and reconstructing curb and gutter on westbound Bollinger Canyon Road at far side of intersection, (3) relocating signal pole and reconstructing pork-chop island at northwest corner of intersection, and (4) modifying traffic signal. The project is solely responsible for funding this measure.*

Under Mitigation Package C, the roadway system would be the same as the 2010 background roadway system described previously, except for the addition of two roadway extensions within and adjacent to the project site (Figure 4.5-12). The first would be the extension of Shadow Creek Drive southward through the project site and into the Dougherty Valley where it would connect with Bollinger Canyon Road. The Shadow Creek Drive extension would function as a high-speed urban arterial with a four-lane divided cross-section. The second would be the extension of Johnston Road westward through the project site where it would connect with the Shadow Creek Drive extension.

These two roadway extensions would provide an alternative east-west route for the northern part of the project site, thus serving to relieve congestion on Camino Tassajara and Crow Canyon Road. Also, the Shadow Creek Drive extension would provide improved circulation and access for the alternative high school location in Dougherty Valley.

Between Camino Tassajara and Shadow Creek Drive, Johnston Road would be upgraded from a two-lane collector street (as planned under the proposed project) to a major four-lane arterial. As a consequence of the change in network, there would be two additional intersections: Shadow Creek Drive and Johnston Road, and Shadow Creek Drive and Bollinger Canyon Road. Both of these intersections were included in this analysis. Note that under this scenario it would not be appropriate to have homes directly accessing Johnston Road. If this mitigation is selected, the site plan should be reconfigured to either provide fronting homes with alternative access or relocate fronting homes.

In order to ascertain the effects of the modified local roadway network (mitigation measure 4.5-3C-1), it was necessary to rerun the traffic model. The change in roadway network would affect the project traffic assignment (Appendix C-IX) which in turn could affect operations at the 79 (77 original plus 2 additional) study intersections. Evaluation of intersection operations under 2010 conditions with the Shadow Creek Drive extension revealed that 8 of the 79 study intersections would be impacted by the project. Implementation of the intersection improvements identified in mitigation measures 4.5-3C-2 through 4.5-3C-9 would mitigate these impacts.

Intersection operations under 2010 project conditions with implementation of Mitigation Measure 4.5-3 Package C are summarized in Table 4.5-11.

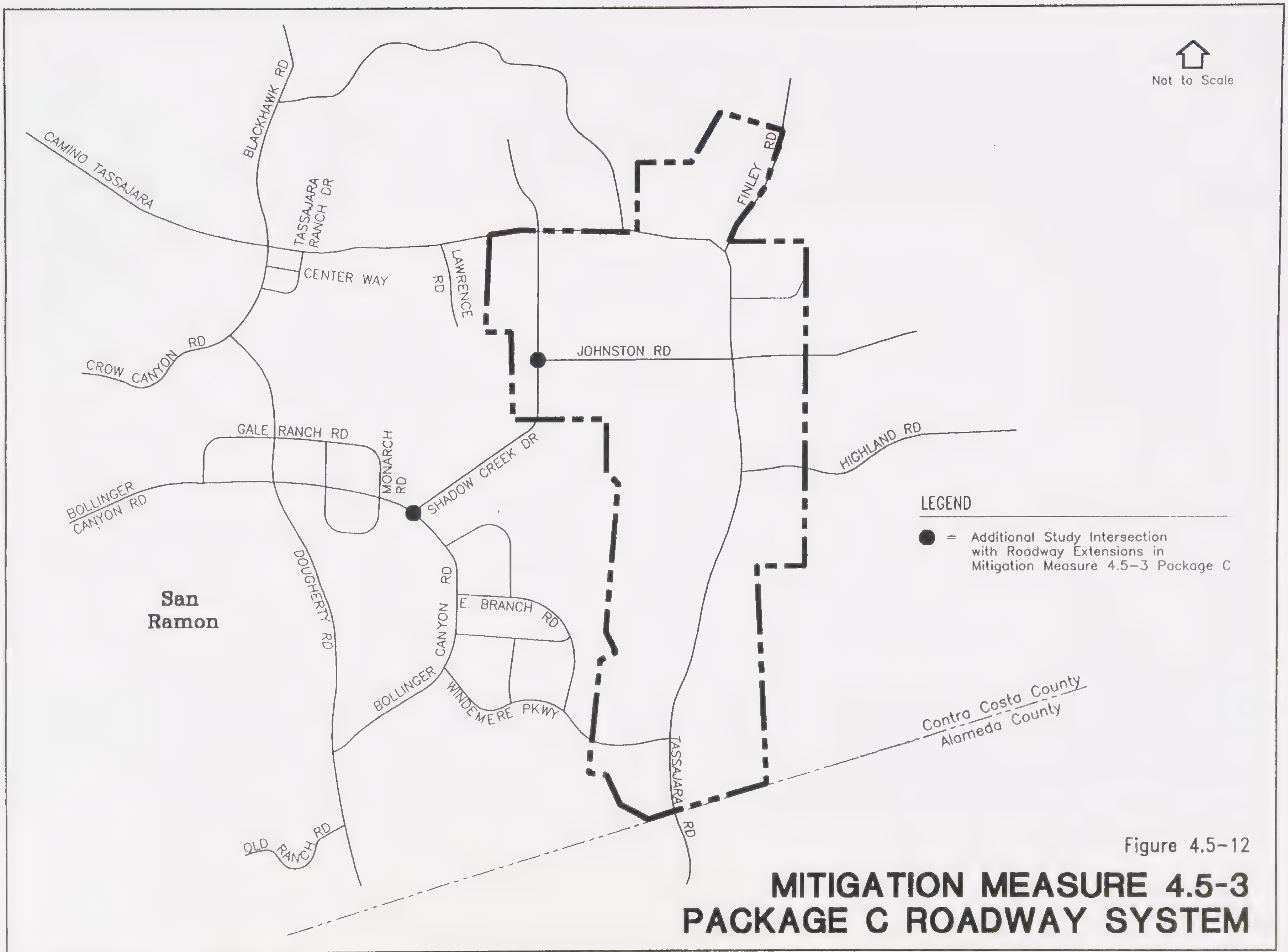

Figure 4.5-12

MITIGATION MEASURE 4.5-3 PACKAGE C ROADWAY SYSTEM

TABLE 4.5-11
INTERSECTION OPERATIONS UNDER 2010 PROJECT CONDITIONS WITH MITIGATION PACKAGE C

	Intersection			Project Unmitigated				Impact?		Project With Mitigations			
				AM Peak		PM Peak				AM Peak		PM Peak	
Node	North/South Street	East/West Street	Location	V/C	LOS	V/C	LOS	AM	PM	V/C	LOS	V/C	LOS
1107	Monarch Road	Bollinger Canyon	CC County	0.62	B	0.62	B			0.64	B	0.67	B
1111	W. of Monarch	Bollinger Canyon	CC County	0.83	D	0.67	B			0.84	D	0.69	B
1573	Tassajara Road	Dublin Blvd.	Alameda Co	1.05	F	0.97	E	P	P	0.86	D	0.89	D
1705	Alcosta Blvd.	Old Ranch Road	San Ramon	0.75	C	0.93	E		S	0.51	A	0.67	B
1743	I-680 NB Off-Ramp	Crow Canyon Road	San Ramon	0.64	B	0.65	B			0.64	B	0.66	B
1744	Camino Ramon	Crow Canyon Road	San Ramon	0.95	E	0.78	C			0.93	E	0.79	C
1760	San Ramon Valley	Crow Canyon Road	San Ramon	0.57	A	0.76	C			0.58	A	0.75	C
1776	Alcosta Blvd.	Crow Canyon Road	San Ramon	0.64	B	0.60	B			0.63	B	0.60	B
1777	Alcosta Blvd.	Norris Canyon	San Ramon	0.28	A	0.41	A			0.27	A	0.38	A
1789	Alcosta Blvd.	Bollinger Canyon	San Ramon	0.79	C	0.92	E		P	0.79	C	0.89	D
3537	Bollinger Canyon	Crow Canyon	CC County	0.65	B	0.62	B			0.65	B	0.62	B
3975	Dougherty/Hopyard Road	I-580 WB Off-Ramp	Dublin	0.71	C	0.87	D			0.71	C	0.88	D
3977	Dougherty Road	Dublin Blvd.	Dublin	0.91	E	0.90	E	S	S	0.84	D	0.85	D
3984	Dougherty Road	Amador Valley	Dublin	0.74	C	0.79	C			0.76	C	0.80	D
3985	Santa Rita Road	W. Las Positas	Pleasanton	0.64	B	0.96	E			0.65	B	0.96	E
3987	Tassajara Road	Gleason Avenue	Alameda Co	0.63	B	0.54	A			0.60	B	0.51	A
3988	Tassajara Road	I-580 WB Off-Ramp	Pleasanton	0.54	A	0.61	B			0.53	A	0.61	B
3993	Hopyard/Dougherty Road	I-580 EB Off-Ramp	Pleasanton	0.56	A	0.70	C			0.57	A	0.70	C
3997	Hopyard Road	W. Las Positas	Pleasanton	0.62	B	1.03	F			0.63	B	1.02	F
4041	Santa Rita Road	I-580 EB Off-Ramp	Pleasanton	0.66	B	0.65	B			0.65	B	0.65	B
4058	Santa Rita Road	Stoneridge Drive	Pleasanton	0.78	C	0.96	E			0.78	C	0.95	E
4545	Shadow Creek Extension	Bollinger Canyon	CC County	—	—	—	—			0.68	B	0.71	C
4546	Shadow Creek Extension	Bollinger Canyon	CC County	—	—	—	—			0.32	A	0.34	A
5340	Camino Tassajara	Bruce Drive	CC County	0.15	A	0.20	A			0.14	A	0.20	A
5341	Camino Tassajara	S. Village Center	CC County	0.31	A	0.30	A			0.22	A	0.21	A
5811	Camino Tassajara	Windemere Pkwy	CC County	1.00	F	0.92	E	S	S	0.65	B	0.62	B
5901	Blackhawk Drive	Camino Tassajara	CC County	0.63	B	0.52	A			0.53	A	0.47	A
5919	N. Links Road	Camino Tassajara	CC County	0.21	A	0.24	A			0.18	A	0.23	A
5920	Bollinger Canyon	S. of E. Branch	CC County	0.43	A	0.54	A			0.53	A	0.63	B
5921	Bollinger Canyon	E. Branch Road	CC County	0.40	A	0.53	A			0.41	A	0.62	B

Table 4.5-11 *continued*

Intersection				Project Unmitigated				Impact?		Project With Mitigations			
				AM Peak		PM Peak				AM Peak		PM Peak	
Node	North/South Street	East/West Street	Location	V/C	LOS	V/C	LOS	AM	PM	V/C	LOS	V/C	LOS
5943	Camino Tassajara	E. Orchard Road	CC County	0.36	A	0.35	A			0.28	A	0.27	A
5978	N. Livermore Avenue	Isabel Pkwy	Alameda Co	0.37	A	0.48	A			0.38	A	0.50	A
6001	Crow Canyon Road	Center Way	Danville	0.52	A	0.63	B			0.43	A	0.49	A
6007	Tassajara Ranch	Camino Tassajara	Danville	0.80	D	0.60	B			0.68	B	0.51	A
6366	Dougherty Valley	Bollinger (N)	CC County	0.73	C	0.89	D			0.70	C	0.86	D
6370	Tassajara Road	Fallon Road	Alameda Co	0.48	A	0.62	B			0.46	A	0.59	A
6410	I-680 SB Off-Ramp	Crow Canyon Road	San Ramon	0.78	C	0.55	A			0.77	C	0.56	A
6437	Gleason	Dublin Blvd.	Alameda Co	0.64	B	0.64	B			0.63	B	0.64	B
6993	Camino Tassajara	Country Loop	CC County	0.45	A	0.32	A			0.35	A	0.24	A
6994	Camino Tassajara	Loop Connector	CC County	0.34	A	0.22	A			0.25	A	0.19	A
6995	Camino Tassajara	Johnston Road	CC County	0.30	A	0.37	A			0.21	A	0.31	A
7091	Crow Canyon Road	Tassajara Ranch	Danville	0.63	B	0.64	B			0.51	A	0.53	A
7147	Shadow Creek	Camino Tassajara	CC County	0.74	C	0.64	B			0.58	A	0.63	B
8249	San Ramon Valley	Sycamore Valley	Danville	0.47	A	0.74	C			0.47	A	0.74	C
8250	I-680 SB Off-Ramp	Sycamore Valley	Danville	0.43	A	0.53	A			0.44	A	0.52	A
8251	I-680 NB On-Ramp	Sycamore Valley	Danville	0.28	A	0.44	A			0.28	A	0.44	A
8252	Camino Tassajara	Sycamore Valley	Danville	0.50	A	0.27	A			0.49	A	0.26	A
8255	I-680 SB Off-Ramp	Bollinger Canyon	San Ramon	0.65	B	0.60	B			0.65	B	0.57	A
8256	I-680 NB Off-Ramp	Bollinger Canyon	San Ramon	0.44	A	0.73	C			0.44	A	0.73	C
8258	Crow Canyon Road	Camino Tassajara	Danville	0.98	E	0.96	E	S	S	0.82	D	0.78	C
8259	Dougherty Road	Crow Canyon Road	San Ramon	0.72	C	0.84	D			0.60	B	0.68	B
8260	Dougherty Road	Old Ranch Road	San Ramon	0.71	C	0.55	A			0.74	C	0.55	A
8265	Camino Tassajara	Highland Road	CC County	0.35	A	0.49	A			0.28	A	0.44	A
8302	Hacienda Drive	I-580 EB ramp	Pleasanton	0.70	C	0.73	C			0.69	B	0.72	C
8305	Hacienda Drive	I-580 WB ramp	Dublin	0.46	A	0.72	C			0.45	A	0.71	C
8306	Hacienda Drive	Dublin Blvd.	Dublin	0.60	B	0.92	E		S	0.58	A	0.86	D
8363	Gale Ranch Road	Bollinger Canyon	CC County	0.56	A	0.57	A			0.57	A	0.57	A
8364	Dougherty Road	Bollinger (S)	CC County	0.58	A	0.43	A			0.67	B	0.42	A
8365	Bollinger Canyon	Windemere Pkwy	CC County	0.70	C	0.75	C			0.73	C	0.77	C
8366	Bollinger Canyon	N. of E. Branch	CC County	0.53	A	0.56	A			0.56	A	0.68	B
9100	Camino Ramon	Bollinger Canyon	San Ramon	0.91	E	0.79	C	S		0.89	D	0.80	D
9101	Norris Canyon	Camino Ramon	San Ramon	0.41	A	0.38	A			0.40	A	0.37	A

Table 4.5-11 *continued*

	Intersection			Project Unmitigated				Impact?		Project With Mitigations			
				AM Peak		PM Peak				AM Peak		PM Peak	
Node	North/South Street	East/West Street	Location	V/C	LOS	V/C	LOS	AM	PM	V/C	LOS	V/C	LOS
9125	Alcosta Blvd.	Pine Valley	San Ramon	0.45	A	0.58	A			0.44	A	0.58	A
9126	Finley Road	Camino Tassajara	CC County	0.16	A	0.21	A			0.15	A	0.57	A
9129	N. Village Center	Camino Tassajara	CC County	0.31	A	0.33	A			0.34	A	0.67	A
9150	Diablo Blvd.	Camino Tassajara	Danville	0.43	A	0.31	A			0.43	A	0.73	A
9164	Green Valley	Diablo Blvd.	Danville	0.74	C	0.61	B			0.73	C	0.60	B
9198	I-680 SB Off-Ramp	Diablo Road	Danville	0.52	A	0.34	A			0.51	A	0.33	A
9204	I-680 NB Off-Ramp	Diablo Road	Danville	0.34	A	0.38	A			0.33	A	0.38	A
9339	Camino Ramon	Executive Pkwy	San Ramon	0.49	A	0.55	A			0.47	A	0.54	A
9340	Sunset Blvd.	Bollinger Canyon	San Ramon	0.86	D	0.91	E		S	0.87	D	0.60	D
9344	Crow Canyon Plaza	Crow Canyon Road	San Ramon	0.60	B	0.82	D			0.60	B	0.84	D
9349	Lawrence Road	Camino Tassajara	CC County	0.63	B	0.67	B			0.49	A	0.53	A
9355	Brookside	Sycamore Valley	Danville	0.61	B	0.35	A			0.60	B	0.35	A
9357	San Ramon Valley	Railroad Avenue	Danville	0.44	A	0.56	A			0.43	A	0.55	A
9414	El Capitan Drive	Crow Canyon Road	San Ramon	0.79	C	0.67	B			0.79	C	0.67	B
9954	Fallon Road	Gleason Road	Alameda Co	0.50	A	0.57	A			0.50	A	0.57	A
9956	Fallon/El Charro Road	I-580 WB ramp	Alameda Co	0.71	C	0.80	D			0.71	C	0.80	D
9957	El Charro/Fallon Road	I-580 EB ramp	Alameda Co	0.40	A	0.47	A			0.37	A	0.48	A

P and S denote that the impact is partially or solely attributable to the project.

Source: Barton-Aschman, 1996.

Secondary Impacts of Road Extensions

The extension of Shadow Creek Drive and Johnston Road through the project into Dougherty Valley, as shown in Figure 4.5-12, would create many environmental impacts, which could include the following.

Grading would be required within Dougherty Valley which was not anticipated by the Dougherty Valley Specific Plan. Depending upon roadway width, it would effect the land uses and grading for residential areas adjacent to the road.

The roadway would pass through lands in Dougherty Valley designated open space and park and recreation for 0.3 mile. Pollutants contained in the roadway drainage could potentially effect the value of wetland habitat areas set aside as mitigation for another development. Drainage would need to be taken into account in the design of the roadway.

Sensitive biological resources could be adversely impacted, particularly the vital north-south wildlife movement corridor along the Alamo Creek drainage. The Johnston Road extension would bisect a continuous band of open space extending from the Hidden Valley are of Dougherty Valley to the two creek crossings near Camino Tassajara. Several oaks would be removed to accommodate a large cut on the ridgecrest. Red-legged frog habitat potentially could be affected with construction of creek crossings. Alignment along the edge of the oak woodland could result in the removal of numerous mature oak trees as well as separate the woodland habitat from the adjacent valley floor where wildlife movement would tend to be concentrated. Off-site, the alignment could adversely effect the habitat value along Alamo Creek if the roadway is not set back an adequate distance from the creek edge.

The Shadow Creek extension would pass through an area of single-family high and single-family medium residential densities. Views along this roadway would be primarily of soundwalls and fairly dense development. Setbacks as recommended for project roadways should be required along the two extensions. The Johnston Road extension could be created as a scenic roadway passing along the golf course and wooded hillside. Visual impacts of this extension would be minimal providing adequate setbacks and landscaping are incorporated into the alignment.

Auto noise will be similar to other areas within the project site, particularly for residents living adjacent to the Shadow Creek extension and the easterly end of the Johnston Road extension. Sound attenuation measures would most likely be required.

Analysis of Mitigation Packages A and B for Camino Tassajara/Crow Canyon Road Intersection

The three mitigation packages are similar in that they include nearly the same intersection improvements at eight of the impacted intersections, but are very different in how they mitigate project impacts at the intersection of Camino Tassajara and Crow Canyon Road. Package A includes construction of two free right-turn lanes. Package B entails reduction of project development in project subarea 1. Package C entails construction of two additional roads by which to access the project site.

It is clear from the analysis of Package A that the entire project subarea 1 (100 percent of the proposed 3,385 households) could be built if two free right-turn lanes (mitigation measure 4.5-3A-6(a)) are implemented at this intersection. It is also clear from the analysis of Package B that only 25 percent of project subarea 1 could be built if neither of the free right-turn lanes were implemented at this intersection. It is not clear, however, how much development could occur in project subarea 1 if only one or the other, but not both, of the two free right-turn lanes were to be implemented. In order to make this determination, these two combinations of improvements at the Crow Canyon/Camino Tassajara intersection were evaluated using intersection level of service. The results of the analysis are summarized as follows.

- With **no improvements** at Crow Canyon/Camino Tassajara there would be intersection capacity to accommodate **25 percent of subarea 1** development.

- With **installation of only a free northbound right-turn lane** at Crow Canyon/Camino Tassajara there would be intersection capacity to accommodate **25 percent of subarea 1** development.

- With **installation of only a free eastbound right-turn lane** at Crow Canyon/Camino Tassajara there would be intersection capacity to accommodate **65 percent of subarea 1** development.

- With **installation of both a free northbound right-turn lane and a free eastbound right-turn lane** at Crow Canyon/Camino Tassajara there would be intersection capacity to accommodate **100 percent of subarea 1** development.

Note that this additional analysis looked at operations at the Camino Tassajara/Crow Canyon Road intersection only, and that development within project subareas 2, 3, and 4 were assumed at 100 percent in all cases.

The first bulleted item reflects the findings described in Mitigation Package B. The second bulleted item indicates that installation of the northbound right-turn lane, by itself, would provide no additional capacity for the critical movements in the AM peak hour, and would thus not provide for any increase in development in project subarea 1. The third bulleted item indicates that installation of the eastbound right-turn lane, by itself, would provide capacity for another 40 percent of development in project subarea 1, for a total allowable development of 65 percent within the subarea. The last bulleted item reflects the findings described in Mitigation Package A, specifically Measure 4.5-3A-6(a).

The proposed intersection improvements described under Mitigation Packages A, B, and C are illustrated in Appendix C-X.

Project On-Site Access, Circulation and Parking Impacts

Introduction

This section describes project features and impacts related to on-site circulation. The analysis includes the roadway network and parking, transit provisions, bicycle provisions, and pedestrian impacts. The level of analysis is dictated by the availability (or lack) of detailed site plan information. The development's circulation plan, shown on Figure 4.5-13, shows the roadway network including alignment and cross-section. Some transit, bicycle, and pedestrian elements can be discerned by reviewing the Tassajara Design Guidelines (1995).

These guidelines prescribe the locations, but not design, of bus stops; park-and-ride lots are called for but no locations are specified. The guidelines specify which streets will have bike lanes and also state that bike paths will be located along Tassajara Road and along creeks. With regard to pedestrian circulation, the guidelines specify which streets will or will not have sidewalks and under what conditions. More detailed discussion of the Design Guidelines is included under the subsections below. However, detailed information about intersection controls, pedestrian paths, parking lot size and location, driveways, building loading docks, etc. are not available. Those elements will be subject to County staff review at the time of application for vested tentative maps.

Roadway Network

Impact 4.5-4 Projected volumes on Windemere Parkway through the project site exceed the capacity of the proposed roadway.

The first element of roadway network review concerns the general adequacy of the system to carry the projected traffic volumes. Figure 4.5-14 shows the planned number of travel lanes and the resultant roadway capacities in terms of peak-hour, peak-direction travel. The analysis focuses on the roadways classified as arterials or greater. The streets classified as collectors or minor roads are short and serve very few homes. None would experience traffic volumes in excess of capacity. For the arterial and larger streets, the capacities are based on a figure of 900 vehicles per hour per lane, which assumes a saturation flow of 1,800 vehicles per hour with 50 percent green time at intersections.

Figure 4.5-15 shows the forecasted traffic volume on each of the major streets. All are expected to be well within capacity except for Windemere Parkway. The project site plan shows Windemere to be a two-lane road. The site plan, thus, is in disagreement with the County General Plan, which calls for four lanes on Windemere Parkway. The projected volume of 1,200 to 1,230 vehicles in the peak direction in the peak hour is well beyond the capacity of a two-lane road.

Figure 4.5-13

TASSAJARA ON-SITE LOCAL CIRCULATION PLAN

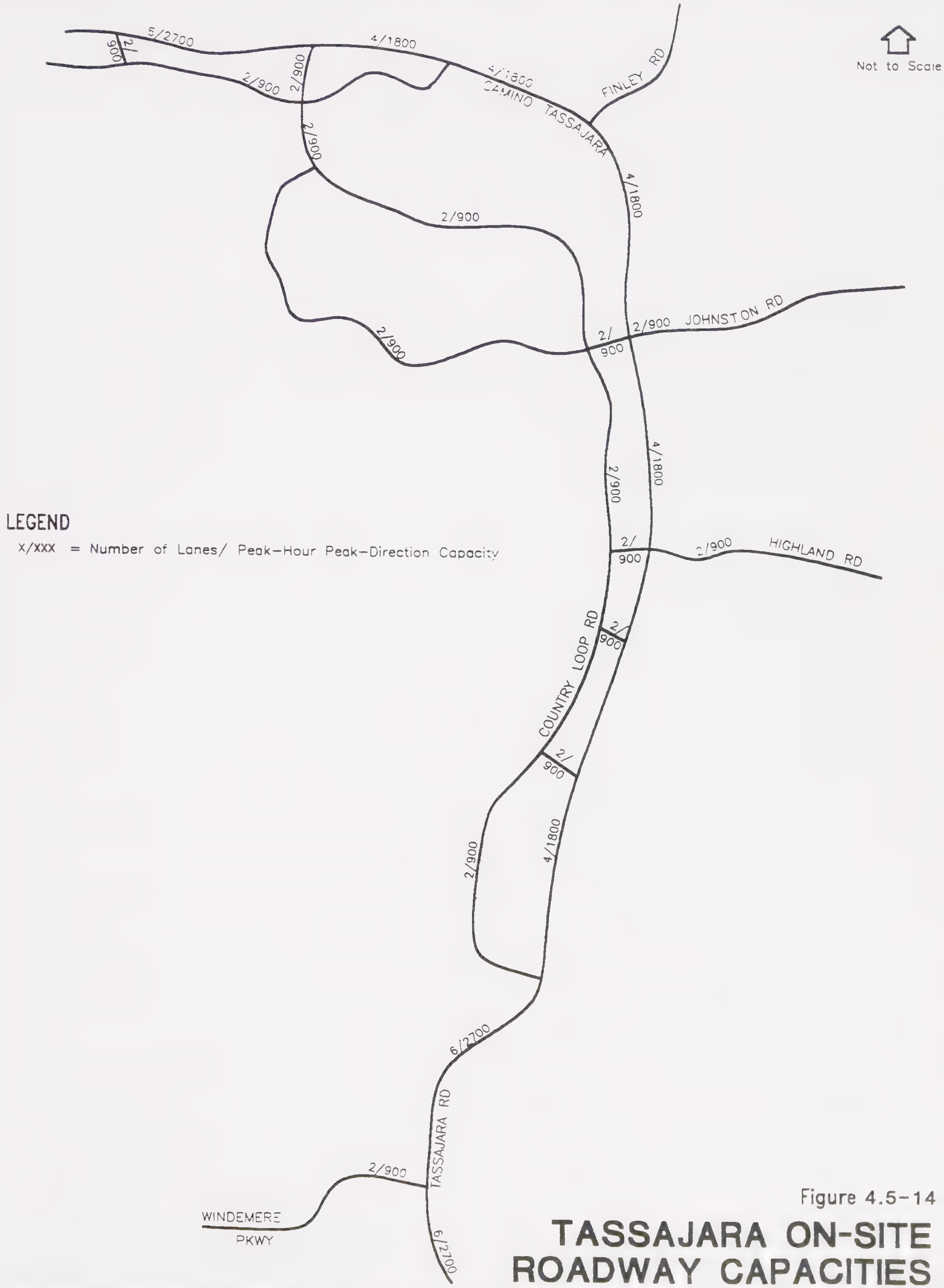

Figure 4.5-14

TASSAJARA ON-SITE ROADWAY CAPACITIES

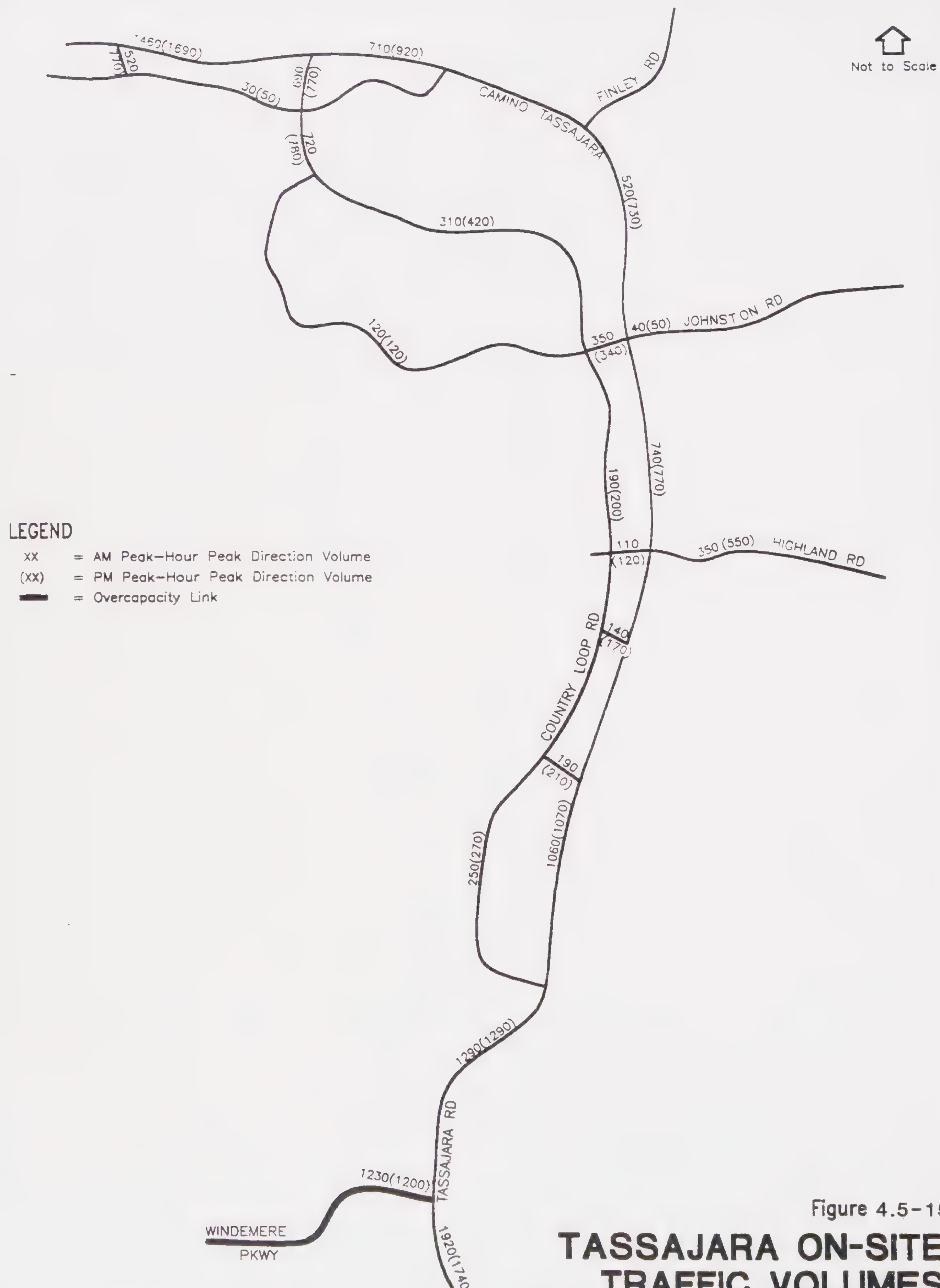

Figure 4.5-15

TASSAJARA ON-SITE TRAFFIC VOLUMES

Mitigation Measure

4.5-4 The site plan should be revised to provide four lanes on Windemere Parkway, consistent with the County General Plan. The project is solely responsible for implementing this measure.

Impact 4.5-5 Several cul-de-sacs and lanes may not meet County road requirements. This is a potentially significant impact.

The roadway cross-sections were compared to the County roadway standards. The findings indicate that almost all the roads conform to county standards with the exception of the roads classified as lanes or cul-de-sacs. The county ordinance code requires that all residential streets that are to be maintained by the county have a minimum width of 32 feet in 52 feet of right-of-way. Public Works may grant an exception and allow the 28-foot width if there will be no on-street parking and sufficient off-street parking is provided. The lanes and cul-de-sacs are shown as 28 feet of pavement in 48 feet of right-of-way.

Mitigation Measure

Either of the following mitigation measures (a or b) would be required to reduce the impacts to a less-than-significant level.

4.5-5(a) The lanes and cul-de-sacs should be widened to the 32-foot County standard.

4.5-5(b) An exception from the County standard should be obtained from Public Works in order to permit 28-foot-wide lanes and cul-de-sacs.

The project is solely responsible for implementing this measure.

Impact 4.5-6 Several cul-de-sacs within the development would exceed County length standards.

The County standard for maximum cul-de-sac length is 700 feet. The reason for length standards is to provide reasonable access for emergency equipment. Figure 4.5-16 shows the locations where cul-de-sacs are planned that exceed the 700-foot County length standard.

Mitigation Measure

Either of the following mitigation measures (a or b) would be required to reduce the impacts to a less-than-significant level.

Figure 4.5-16

TASSAJARA ON-SITE CUL-DE-SACS OVER 700 FEET IN LENGTH

4.5-6(a) *Alternative access should be provided for emergency vehicles to any parcels located more than 700 feet from a single access road. Any proposed alternative access would be subject to the review and approval of the Fire District.*

4.5-6(b) *The site plan should be revised and cul-de-sacs shortened.*

The project is solely responsible for implementing this measure.

Impact 4.5-7 Specific intersection controls could impact traffic delay and safety. This is a potentially significant impact.

The existing site plan is not sufficiently detailed to show planned intersection controls. Intersection controls need to be appropriate for the type of intersecting streets and the projected volumes. Lack of appropriate controls would result in traffic delays and safety problems.

Mitigation Measures

The following mitigation measures are required to reduce the impact of insufficient intersection controls to a less-than-significant level.

4.5-7(a) *A preliminary evaluation of intersection traffic controls for the major streets was completed based on projected traffic volumes (Figure 4.5-17). At a minimum, these controls shown on the figure should be installed. Intersection controls at other locations may also be needed, subject to further review of site plans at the subdivision map stage.*

4.5-7(b) *County staff should review detailed site plans when they become available and require appropriate intersection traffic controls. These should be the responsibility of the developer to install.*

The project is solely responsible for implementing this measure.

Impact 4.5-8 Close spacing of intersections may create sight distance problems for oncoming traffic. This is a potentially significant impact.

The site plan includes many locations where an entrance road to Camino Tassajara has another local road intersection within 150 feet. Unless properly designed, these locations could be dangerous. The problem occurs when fast traffic on the main road turns in to a neighborhood and then immediately encounters another intersection. Sight distance at that intersection is limited by the close spacing between the frontage road and Camino Tassajara.

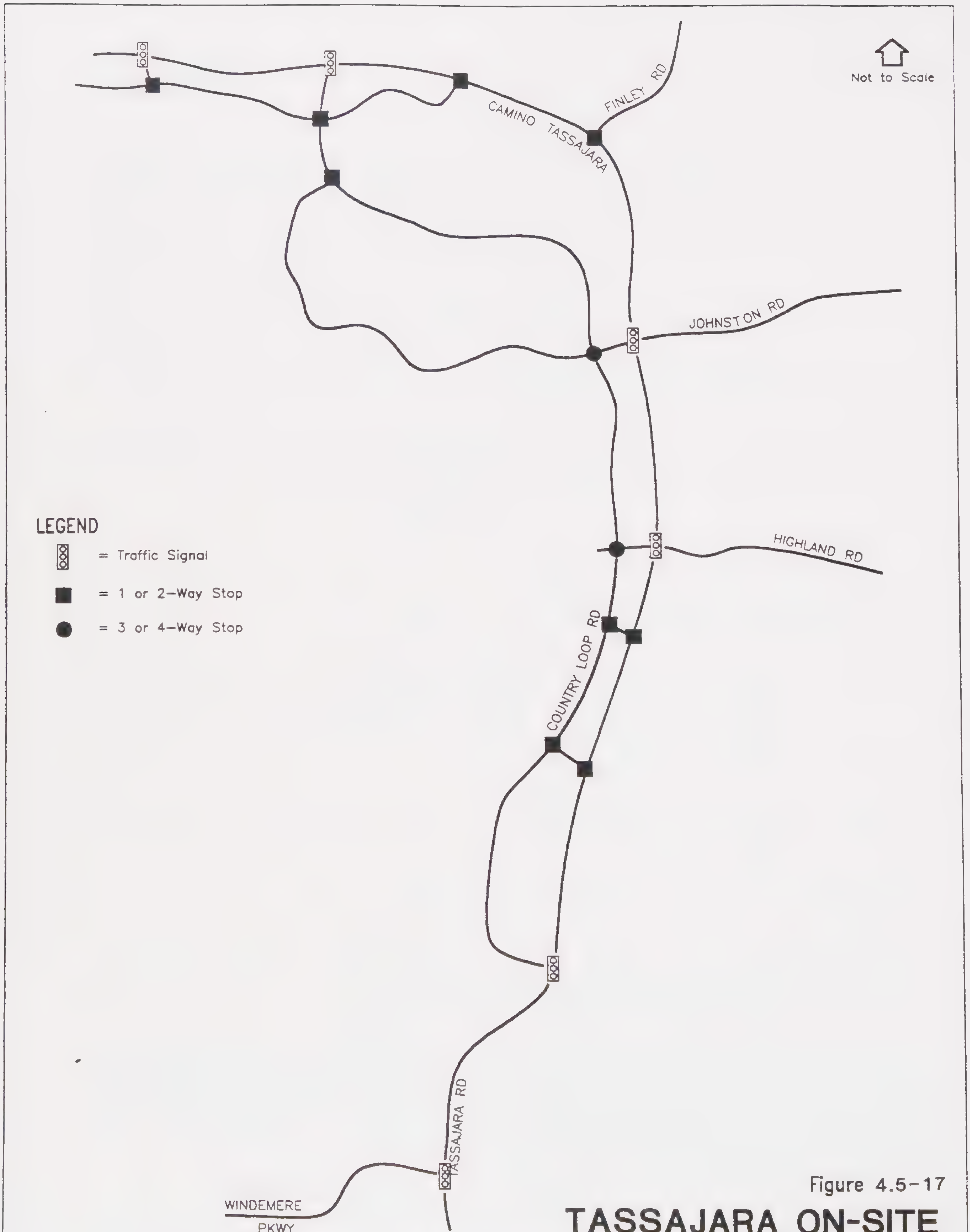

Figure 4.5-17

TASSAJARA ON-SITE RECOMMENDED TRAFFIC CONTROL

Mitigation Measure

4.5-8 *County staff should review detailed site plans when they become available to ensure that sight distances at the entrance roads are adequate for speeds on the roadways. Increased distances between intersections may be necessary.*

The project is solely responsible for implementing this measure.

Impact 4.5-9 Horizontal and vertical alignment may be too tight and/or have inadequate sight distance at several locations within the Tassajara development. This is a significant impact.

The street layout features curving streets and short streets, which is an effective design to minimize speeds. The drawback is that curving streets introduce concerns about horizontal alignment and sight distance. Figure 4.5-18 shows locations where alignment is too tight and sight distance appears to be inadequate. Vertical sight distance must also be considered in a hilly area such as the project site. Vertical site distance refers to the ability of motorists to see over the crest of hills to identify hazards that might be on the other side. Intersections should either be located right at the crest or several hundred feet away to avoid sight distance problems.

The site plan is insufficiently detailed to analyze vertical sight distance, but the hilly area gives cause for concern. Furthermore, the site plan does not give details about design and landscaping at all of the intersections. These details, if designed improperly, can also create inadequate sight distance for motorists approaching the intersection.

Mitigation Measures

The following mitigation measures are required to reduce the impact of sight distance to a less-than-significant level.

4.5-9(a) *The road system should be modified to eliminate the obvious locations with horizontal alignment problems as shown in Figure 4.5-18.*

4.5-9(b) *County staff should carefully review subsequent detailed site plans with regard to vertical sight distance and horizontal sight distance at intersections. If necessary, the plans should be modified to eliminate problem locations.*

The project is solely responsible for implementing this measure.

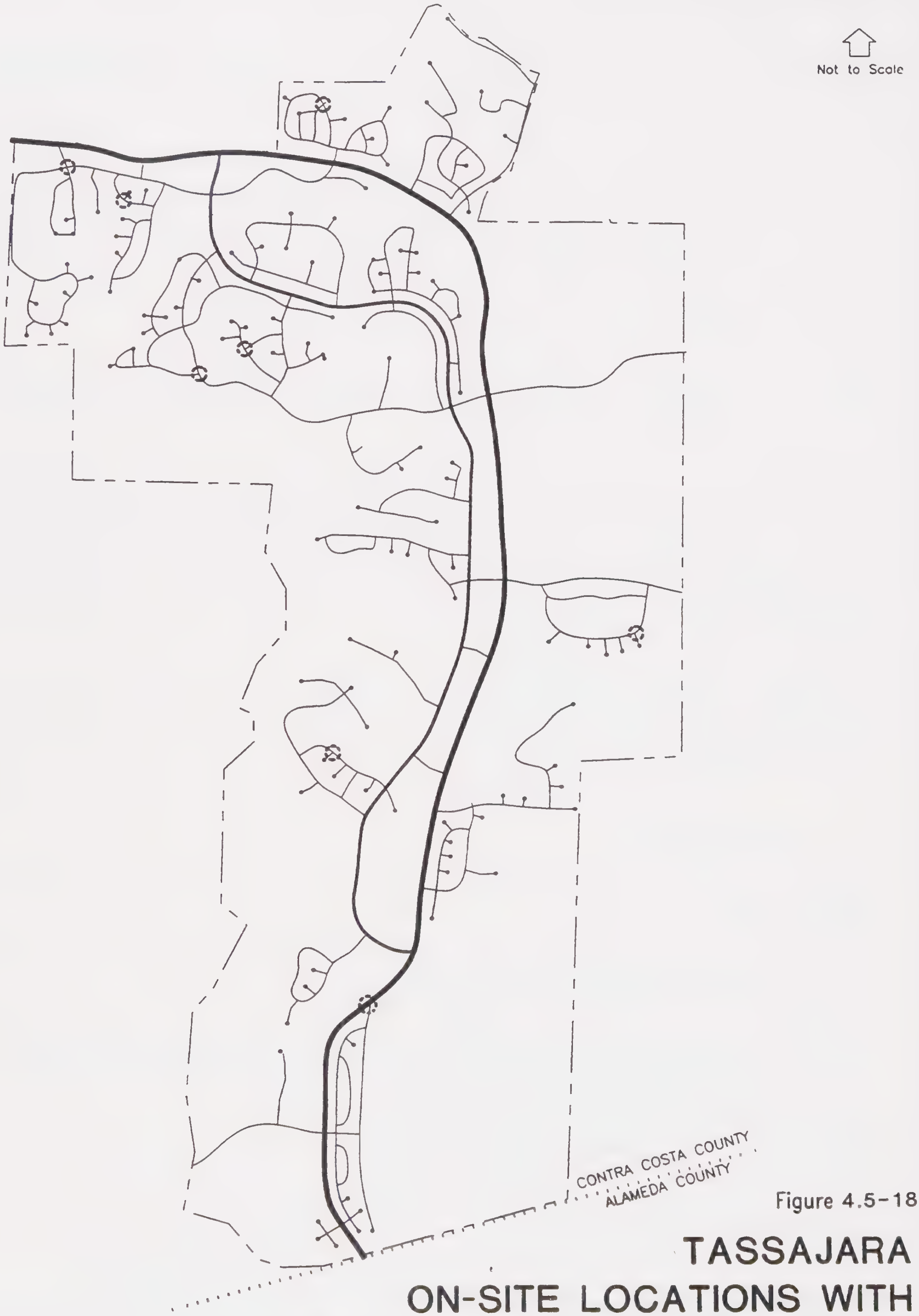

Figure 4.5-18

TASSAJARA ON-SITE LOCATIONS WITH HORIZONTAL ALIGNMENT PROBLEMS

Impact 4.5-10 The design and location of driveways, median breaks, and curb radii can affect traffic congestion and safety. This is a potentially significant impact.

The site plan does not provide sufficient information about these street design details, including access to remaining small acreage parcels. The County has standards governing these roadway design features. Future more detailed site plans submitted in support of subdivision maps will need to demonstrate compliance with the standards.

Mitigation Measure

4.5-10 The streets should be designed in accordance with County standards. Some access should be maintained for existing parcels. Access to small-acreage parcels should not come directly from Camino Tassajara wherever possible. In locations where no other access is possible, access should be limited to right-turns-in and -out only. County staff should review subsequent detailed site plans to determine compliance with standards.

The project is solely responsible for implementing this measure.

Impact 4.5-11 Geometric requirements at project intersections could necessitate acquisition of additional right-of-way. This is a potentially significant impact.

Project intersections are those intersections that would be created only as part of the project circulation system. Project intersections would be located either on Camino Tassajara or within the internal on-site circulation system. The project site plan shows numerous project intersections located along Camino Tassajara and located within the on-site circulation system. The project intersections on Camino Tassajara were analyzed and shown not to be impacted by the project.

Traffic conditions were not, as part of this study, analyzed at any of the intersections located within the proposed on-site circulation system. To conduct such an analysis would require a foreknowledge of land uses, driveway locations, and parking locations on a parcel-by-parcel basis; none of which is detailed on the current site plan or in the current project definition. When this information becomes available, the geometric requirements at the internal on-site intersections can be determined from a detailed analysis of on-site traffic conditions. Based on the required intersection geometrics, the right-of-way needs would be established for each intersection. If the right-of-way needs exceed the existing or planned available right-of-way, then additional right-of-way would need to be acquired.

Mitigation Measure

4.5-11 Right-of-way needs at project intersections should be evaluated to ensure that the project provides, at the time of project construction, sufficient right-of-way to accommodate the needed intersection lane geometrics.

The project is solely responsible for implementing this measure.

Parking, Truck Loading Areas and Driveway/Aisle Widths

Impact 4.5-12 On-street parking may be eliminated from some streets depending on residential need and topography. This is a potentially significant impact.

The Tassajara Design Guidelines indicate that on-street parking will be provided along most streets but that it may be eliminated depending upon residential need and site topography. The norm and expectation in suburban residential areas is that on-street parking will be allowed on both sides of the street. Any departure from this pattern needs to be carefully considered. On-street parking should always be provided in front of residential lots and other elements that will attract cars, such as parks. Parking may be eliminated on the "unused" side of single-loaded streets only if the area is of low enough density that parking on one side is sufficient.

Mitigation Measures

The following mitigation measures are required to reduce the impact of residential and commercial parking, sufficiency of truck loading areas and driveway/aisle widths to a less-than-significant level.

4.5-12(a) *Parking should be provided in accordance with the County standards. The parking standard could be partially met with on-street parking if it is available. If the County parking standard cannot be met with on-street parking, then it must be met with off-street parking.*

4.5-12(b) *Parking for the residential and nonresidential areas, such as businesses, schools, parks, etc., has not been detailed on the site plan. Sufficient parking needs to be provided to avoid impacts on residential areas. As subdivision plans are filed, future applicants will be required to meet County parking standards.*

The project is solely responsible for implementing this measure.

Impact 4.5-13 Insufficient parking in the commercial areas, or parking lots with inadequate design, could result in congestion or safety problems. This is a potentially significant impact.

The commercial areas must have sufficient parking to accommodate the demand. This can be studied once the specific uses are identified.

Also related to parking is the need for loading areas and adequate driveway and aisle width for commercial vehicles. This detail is beyond the current level of site planning. However, the lack of these facilities would have a negative impact on the road system.

Mitigation Measure

4.5-13 All commercial buildings should be provided with adequate truck loading areas. County staff should review parking and loading area designs to ensure adequate space is available for truck maneuverability prior to subdivision approval.

The project is solely responsible for implementing this measure.

Transit Provisions

Impact 4.5-14 Substantial portions of the development would be located more than one-quarter mile from a bus stop. This is a potentially significant impact.

The Tassajara Design Guidelines call for bus stops where local streets or pedestrian paths intersect the main streets. This will be interpreted to mean where they intersect Camino Tassajara or Country Loop Road. Figure 4.5-19 shows that this will still leave substantial portions of the project more than one-quarter mile from a bus stop. (It is generally accepted that people are unlikely to walk more than one-quarter mile to access a bus stop.) The topography of the site makes it difficult to move more home sites closer to the transit lines as well as discourage residents to walk or bicycle to the transit stops.

The Design Guidelines call for bus stops and also state that "bus shelters are encouraged." This provision may not be strong enough to encourage transit ridership.

Mitigation Measures

All of the following mitigation measures are required to reduce the impact of insufficient transit facilities to a less-than-significant level.

4.5-14(a) The development plan/vesting tentative map shall include provisions for construction of a collector road system that provides efficient and convenient bus routing within one-quarter mile of 80 percent of the project households. Where feasible, cul-de-sacs that back up to the arterial or collectors shall have a pedestrian/bicycle path between the cul-de-sac and the road to allow convenient access to transit stops. Transit providers shall be consulted to ensure that the circulation plans will allow them to provide efficient service (CCCDD, 1993).

4.5-14(b) Park-and-ride lots need to be provided at activity nodes along the main roads. The Tassajara Design Guidelines call for park-and-ride lots but their locations have not been specified. County staff should ensure that future site plans include park-and-ride lots in convenient and secure locations. The locations should be at the three activity nodes along Country Loop Road: the northern commercial area, the central commercial area, and the southern school/community center location. Each park-and-ride lot should accommodate 50 cars and should be provided with a transit shelter.

Figure 4.5-19

TASSAJARA
ON-SITE AREAS MORE THAN ONE-QUARTER MILE FROM A BUS STOP

4.5-14(c) When subsequent site plans are prepared that detail the design and location of bus stops, County staff should share them with the transit agency (CCCTA) to get their input. Bus stops should be designed in accordance with CCCTA guidelines or the guidelines of any other transit provider that will serve this area. In addition, bus shelters should be provided at the park-and-ride lots and at the heart of the commercial and community centers.

The project is solely responsible for implementing this measure.

Bicycle Circulation

Bicycle circulation is adequately addressed in the Tassajara Design Guidelines, Circulation Plan, and Park and Open Space Plan. The guidelines call for bike lanes on Camino Tassajara, Country Loop Road, and the entry roads (see Figure 4.5-20). In addition, Camino Tassajara would have a combination bike/pedestrian path along both sides. The arterial roads, although not including striped bike lanes, would be wide enough to safely separate bikes from cars. The collector and minor roads would have very low traffic volumes, so bikes and cars could safely share the road. The Design Guidelines also state that combination bike/pedestrian paths would be built in the "open space along creeks." These paths would provide an extra benefit since the roadway system adequately provides or bicycles. The guidelines also call for secure bicycle parking at major bus stops, park-and-ride lots, and at the commercial centers.

Pedestrian Circulation

Impact 4.5-15 Potential pedestrian/vehicle safety conflicts may occur on residential streets.

The pedestrian circulation system includes sidewalks along the streets and separate off-street paths. According to the design guidelines, all streets classified as arterial roads or bigger will have sidewalks on both sides. The guidelines state that collector and minor streets will have sidewalks "on either one or two sides of the street, depending on residential need and site topography." They further state that sidewalks may be eliminated on cul-de-sacs with 20 units or less. These guidelines are in conflict with County standards, which require sidewalks on all residential streets.

Mitigation Measure

4.5-15 Provide sidewalks on all public residential streets, in conformance with County standards.

The project is solely responsible for implementing this measure.

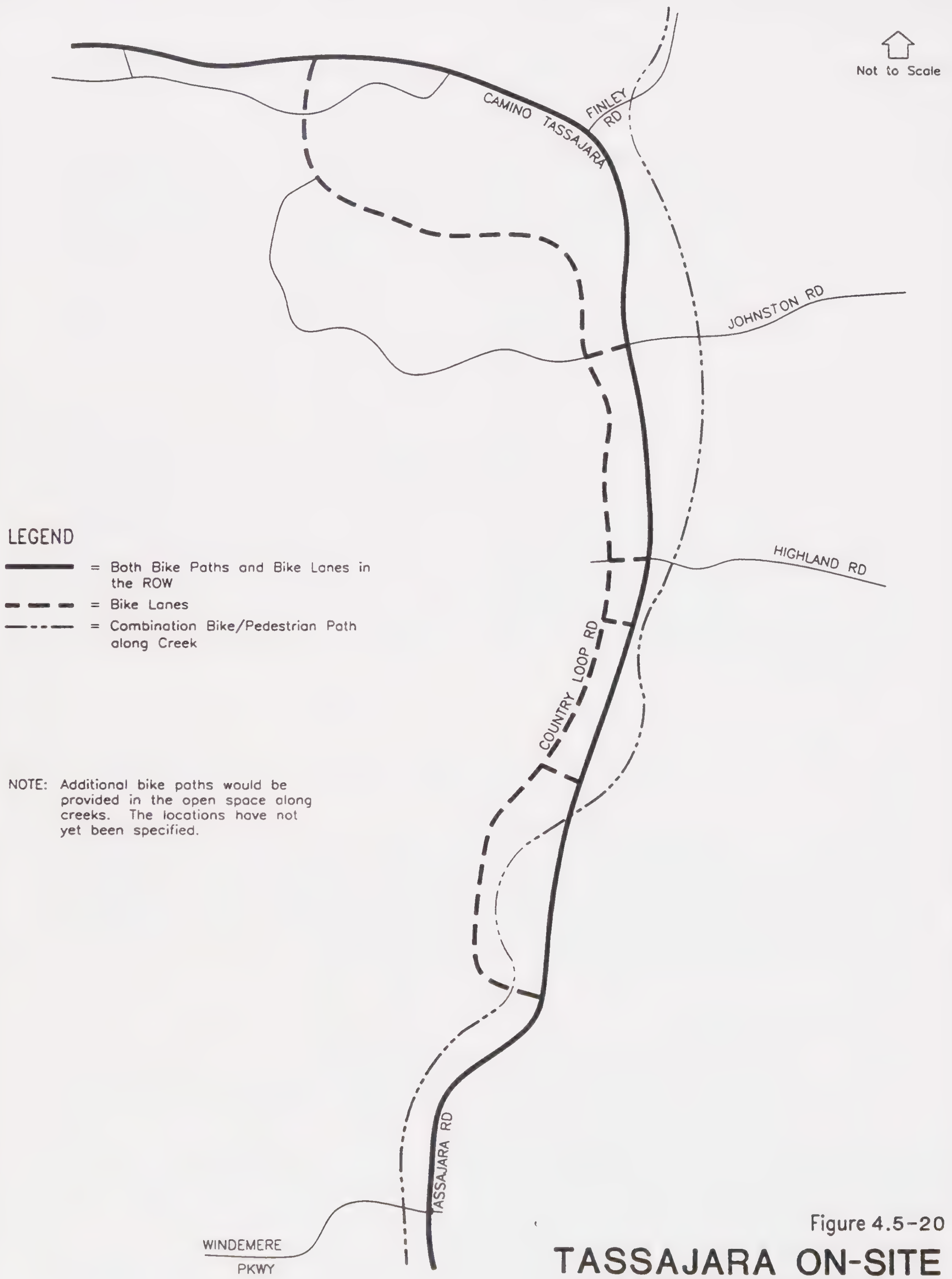

Figure 4.5-20
TASSAJARA ON-SITE PLANNED BIKEWAYS

School Locations

Impact 4.5-16 Potential pedestrian/vehicle safety conflicts may occur near or at the school sites.

Development plans call for three schools (two elementary and one middle school) all located along Country Loop Road. Because of the long distances between the schools and many houses, coupled with the hilly topography, it can be assumed that most of the children will not walk or bicycle to the school sites. They will either travel by bus or be dropped off. Studies show that drop off/pick up trips to/from schools can be significant contributors to vehicle miles traveled and congestion.

Additionally, the more vehicles traveling to/from the school increase the potential for pedestrian/vehicle safety conflicts, particularly around the school sites and where students must cross major busy streets such as Country Loop Road and Camino Tassajara. Student safety is considered a potential significant impact.

Mitigation Measures

All of the following mitigation measures are required to reduce the impact of potential vehicle/pedestrian conflicts to a less-than-significant level.

4.5-16(a) *Crossing guards should be provided on Country Loop Road in front of the schools and also along Camino Tassajara at key crossing points.*

4.5-16(b) *Bus service should be provided for elementary and middle school students. This will help to reduce traffic congestion in and around the school sites.*

4.5-16(c) *When subdivision plans are submitted in the future, detailed circulation/access plans for each of the school sites within the project will be required. These plans should take into account adjacent and nearby uses (parks, commercial areas, etc.) and provide intersection and street configurations and driveway locations. Pick-up and drop-off at the school sites should also be considered in the plans. Signal warrants, off-street parking and intersection capacity near the school/park site should be analyzed. Cooperative planning with the School District is encouraged to minimize on-street parking and eliminate the need to provide wider roadway widths to accommodate large volumes of on-street parking near schools. Pick-up and drop-off access at the schools should be on a separate road from the bus loading and unloading where possible.*

The project is solely responsible for implementing this measure.

Transit Impacts

Impact 4.5-17 The project will generate an unfilled demand for transit service.

According to the Tri-Valley Transportation Model, the with-project scenario would result in no greater transit ridership than the no-project scenario. This is not surprising since the 2010 transit network includes no bus service to the Tassajara Valley. Nevertheless, the project is described as providing transit amenities and will certainly generate the demand for transit ridership. This is a significant project impact.

Transit service should be provided. At a minimum, this should include bus service with one-half hour headways to Bishop Ranch business park and to the planned East Dublin/Pleasanton BART station. The bus service should be operated by County Connection and funded by CCCTA or operated and funded by another transit provider. Revenues to operate this service would come from the increased tax base created by the occupation of residences within the project area.

Mitigation Measure

4.5-17 *Bus service with one-half hour headways, at a minimum, should be provided to Bishop Ranch Business Park and the Dublin/Pleasanton BART station. Funding should be made available through CCCTA, another transit provider, or a Tri-Valley impact fee program. The project is solely responsible for implementing this measure.*

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4.6 NOISE

INTRODUCTION

Fundamentals of Environmental Acoustics

Noise is defined as unwanted sound. Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. Sound levels are usually measured and expressed in decibels (dB) with 0 dB corresponding roughly to the threshold of hearing. Decibels and other technical terms are defined in Table 4.6-1.

Most of the sounds which we hear in the environment do not consist of a single frequency, but rather a broad band of frequencies, with each frequency differing in sound level. The intensities of each frequency add together to generate a sound. The method commonly used to quantify environmental sounds consists of evaluating all of the frequencies of a sound in accordance with a weighting that reflects the fact that human hearing is less sensitive at low frequencies and extreme high frequencies than in the frequency mid-range. This is called "A" weighting, and the decibel level so measured is called the A-weighted sound level (dBA). In practice, the level of a sound source is conveniently measured using a sound level meter that includes an electrical filter corresponding to the A-weighting curve. Typical A-levels measured in the environment and in industry are shown in Table 4.6-2 for different types of noise.

Although the A-weighted noise level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a conglomeration of noise from distant sources which create a relatively steady background noise in which no particular source is identifiable. To describe the time-varying character of environmental noise, the statistical noise descriptors, L_{10}, L_{50}, and L_{90}, are commonly used. They are the A-weighted noise levels equaled or exceeded during 10 percent, 50 percent, and 90 percent of a stated time period. A single number descriptor called the L_{eq} is now also widely used. The L_{eq} is the average A-weighted noise level during a stated period of time.

In determining the daily level of environmental noise, it is important to account for the difference in response of people to daytime and nighttime noises. During the nighttime, exterior background noises are generally lower than the daytime levels. However, most household noise also decreases at night and exterior noise becomes very noticeable. Further, most people sleep at night and are very sensitive to noise intrusion. To account for human sensitivity to nighttime noise levels, a descriptor, L_{dn} (day/night average sound level), was developed. The L_{dn} divides the 24-hour day into the daytime of 7:00 AM to 10:00 PM and the nighttime of 10:00 PM to 7:00 AM. The nighttime noise level is weighted 10 dB higher than the daytime noise level. The Community Noise Equivalent Level (CNEL) is another 24-hour average which includes both an evening and nighttime weighting.

TABLE 4.6-1
DEFINITIONS OF ACOUSTICAL TERMS

Term	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded one percent, 10 percent, 50 percent, and 90 percent of the time during the measurement period.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 PM to 10:00 PM and after addition of 10 decibels to sound levels in the night between 10:00 PM and 7:00 AM.
Day/Night Noise Level, L_{dn}	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 PM and 7:00 AM.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

TABLE 4.6-2
TYPICAL SOUND LEVELS
MEASURED IN THE ENVIRONMENT AND INDUSTRY

At a Given Distance From Noise Source	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Impression
	140		
Civil Defense Siren (100')	130		
Jet Takeoff (200')	120		Pain Threshold
	110	Rock Music Concert	
Pile Driver (50')	100		Very Loud
Ambulance Siren (100')			
	90	Boiler Room	
Freight Cars (50')		Printing Press Plant	
Pneumatic Drill (50')	80	In Kitchen With Garbage Disposal Running	
Freeway (100')			
	70		Moderately Loud
Vacuum Cleaner (10')	60	Data Processing Center	
		Department Store	
Light Traffic (100')	50	Private Business Office	
Large Transformer (200')			
	40		Quiet
Soft Whisper (5')	30	Quiet Bedroom	
	20	Recording Studio	
	10		Threshold of Hearing
	0		

The effects of noise on people can be listed in three general categories:

- subjective effects of annoyance, nuisance, dissatisfaction;
- interference with activities such as speech, sleep, learning; and
- physiological effects such as startling, hearing loss.

The levels associated with environmental noise, in almost every case, produce effects only in the first two categories. Workers in industrial plants can experience noise in the last category. Unfortunately, there is as yet no completely satisfactory way to measure the subjective effects of noise, or of the corresponding reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance, and habituation to noise over differing individual past experiences with noise.

An important way of determining a person's subjective reaction to a new noise is the comparison of the existing environment to which one has adapted: the so-called "ambient." In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by the hearers.

With regard to increases in A-weighted noise level, knowledge of the following relationships will be helpful in understanding this section of the report.

- Except in carefully controlled laboratory experiments, a change of 1 dB cannot be perceived.
- Outside of the laboratory, a 3 dB change is considered a just-perceivable difference.
- A change in level of at least 5 dB is required before any noticeable change in community response would be expected.
- A 10 dB change is subjectively heard as approximately a doubling in loudness, and would almost certainly cause an adverse change in community response.

SETTING

Regulatory Background

The Tassajara Valley planning area is located in an unincorporated portion of Contra Costa County. Goals and policies contained in the Noise Element of the *General Plan* for Contra Costa County are used in the assessment of noise associated with this project. The applicable goals and policies adopted by the County follow.

Goals

11-A To improve the overall environment in the County by reducing annoying and physically harmful levels of noise for existing and future residents and for all land uses.

11-B To maintain appropriate noise conditions in all areas of the County.

11-C To ensure that new developments will be constructed so as to limit the effects of exterior noise on the residents.

11-E To recognize citizens' concerns regarding excessive noise and utilize measures through which the concerns can be identified and mitigated.

Policies

11-1 New projects shall be required to meet acceptable exterior noise level standards as established in the Noise and Land Use Compatibility Guidelines (see Figure 4.6-1).

11-2 The standard for outdoor noise levels in residential areas is an L_{dn} of 60 dBA. This standard is primarily applicable to primary outdoor use areas, such as backyards of single-family residences and common use areas for multi-family housing projects.

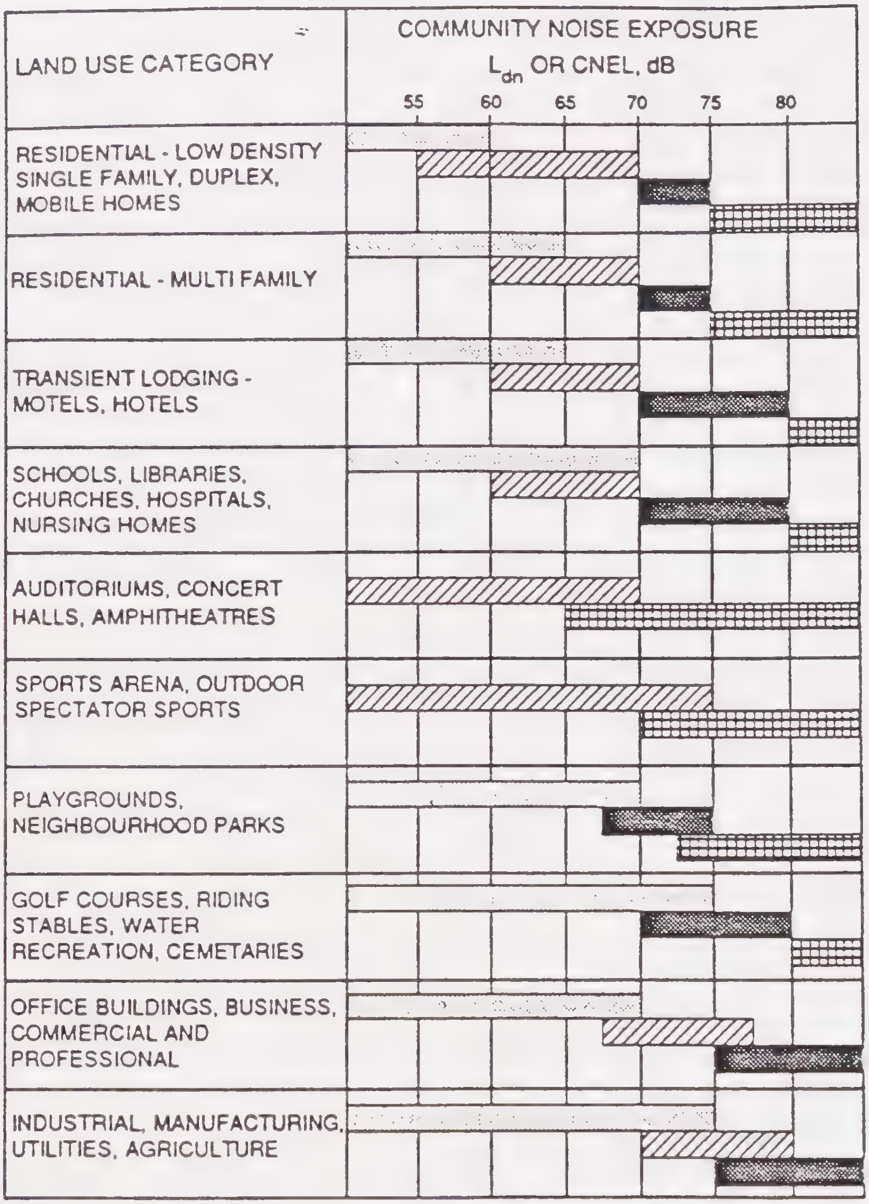
11-4 Title 24, Part 2 of the California Code of Regulations requires that new multiple-family housing projects, hotels, and motels exposed to an L_{dn} of 60 dBA or greater have a detailed acoustical analysis describing how the project would reduce interior noise at or below an L_{dn} of 45 dBA. The 45-L_{dn} interior noise limit is extended by the County to apply to single-family residences, as well.

11-6 If an area is currently below the maximum "normally acceptable" noise level, an increase in noise up to the maximum should not be allowed necessarily.

11-8 Construction activities should be allowed primarily during normal work hours to provide relative quiet during sensitive evening, nighttime, and early morning periods.

11-9 Attempt to locate noise sensitive land uses away from noisy areas.

11-11 Noise impacts upon the natural environment, including impacts on wildlife, should be evaluated and considered in review of development projects.



NORMALLY ACCEPTABLE
Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

CONDITIONALLY ACCEPTABLE
New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.

NORMALLY UNACCEPTABLE
New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

CLEARLY UNACCEPTABLE
New construction or development clearly should not be undertaken.

Source: Noise Element of General Plan of Contra Costa County, January 1991

NOISE AND LAND USE COMPATIBILITY GUIDELINES

Figure 4.6-1

ILLINGWORTH & RODKIN, INC./Acoustical Engineers

The County has also adopted implementation measures to be used during project review for incorporating the appropriate noise mitigation. Some of the implementation measures adopted by the County and applicable to this project follow.

11-A Continue to require review and analysis of noise-related impacts as part of project development review procedures by the County.

11-B Evaluate noise impacts of new projects on existing land uses in terms of applicable Federal, State, and local codes and the potential for adverse community response based on a significant increase in existing noise levels.

11-C Encourage proper site planning, architectural layout of buildings, construction of noise barriers, and construction modifications as alternative forms of noise mitigation for individual projects.

Existing Noise Environment

The project boundaries are shown in Figure 4.6-2. A noise survey was undertaken in and around the project site between October 26 and 28, 1993. The noise monitoring survey consisted of six long-term (24-hour) and eight short-term (15-minute) noise measurements. The noise measurement locations are shown in Figure 4.6-2.

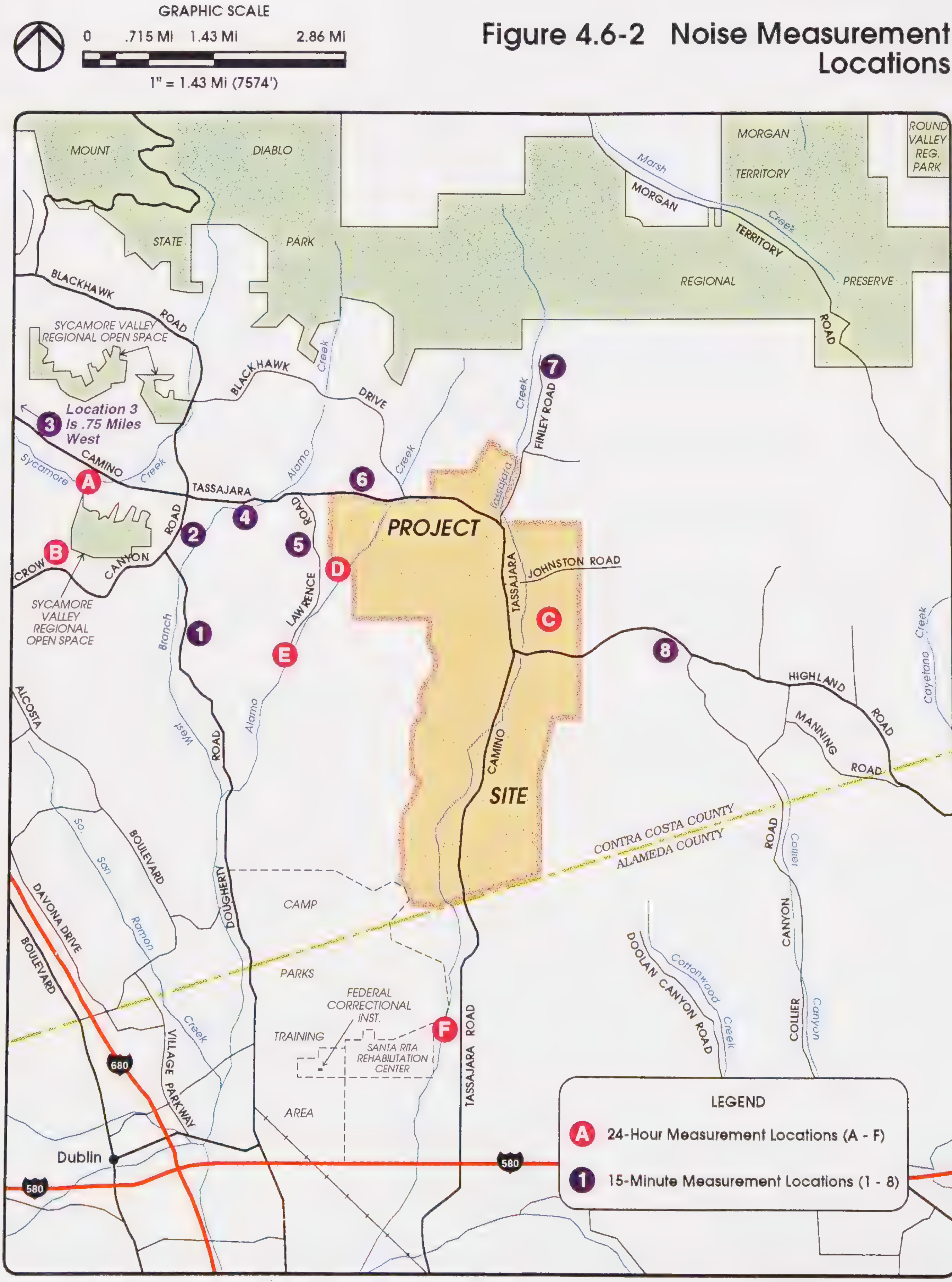
During the site visit, existing noise sensitive land uses in the vicinity of the project were identified. The project site is located in an area of transition. Several new residential developments are currently or have been recently constructed to the west of the site along Camino Tassajara. The Blackhawk residential community, fronting Camino Tassajara, adjoins the project site to the north. Several scattered residences also front streets in and around the project site.

The measurements were taken to establish the current noise exposure of the site and of existing noise sensitive receptors in and around the project area. The results of the six 24-hour measurements are shown graphically in Figures 4.6-3 and 4.6-4. The short-term measurements are summarized in Table 4.6-3.

Measurements at Location A were taken 110 feet from the centerline of Camino Tassajara, west of Crow Canyon Road. Noise levels at this location were dominated by traffic on Camino Tassajara. Noise levels recorded reflect the current noise exposure of residences adjacent to the road. The hourly average noise level (L_{eq}) ranged between 47 and 63 dBA and the 24-hour average noise level (L_{dn}) was 62 dBA.

Measurements at Location B were taken 62 feet from the centerline of Crow Canyon Road, west of St. George Drive. Traffic on Crow Canyon Road dominated noise levels at this location. The hourly L_{eq} ranged between a low of 52 dBA and a high of 72 dBA and the L_{dn} was 72 dBA. Noise levels recorded at this location are representative of the exposure of several residences and apartments along Crow Canyon Road.

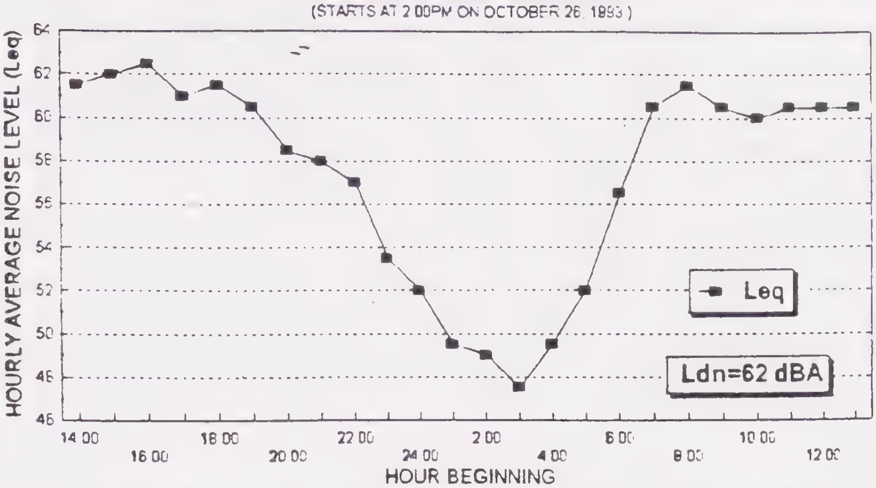
Figure 4.6-2 Noise Measurement Locations



SOURCE: ILLINGWORTH & RODKIN, INC.

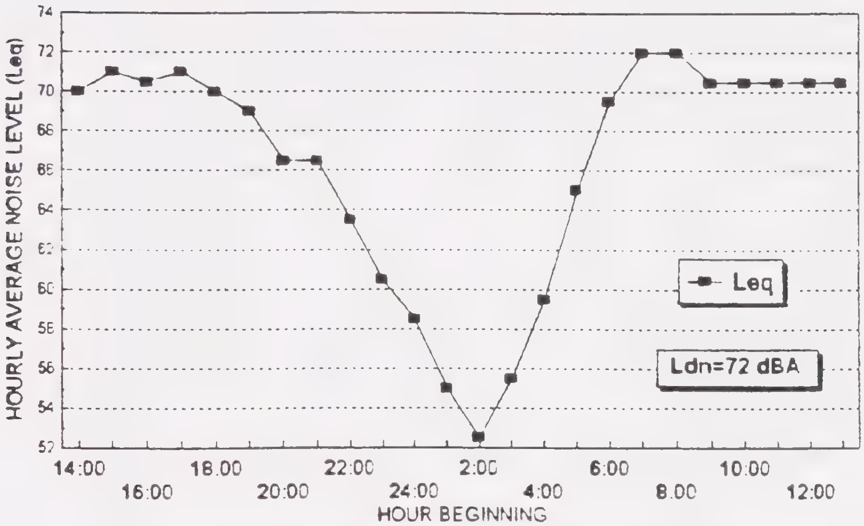
LOCATION A : 110 FEET FROM THE CENTERLINE OF CAMINO TASSAJARA; WEST OF CROW CANYON ROAD

(STARTS AT 2:00PM ON OCTOBER 26, 1993)



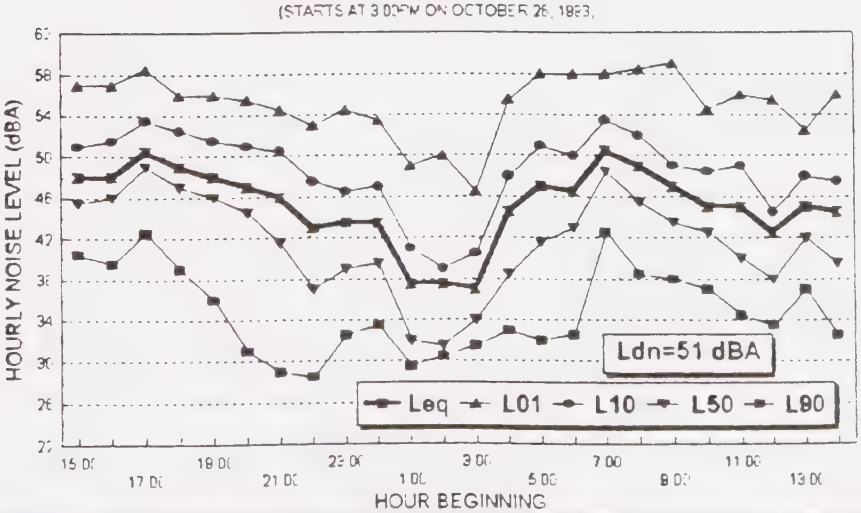
LOCATION B : 62 FEET FROM THE CENTERLINE OF CROW CANYON RD.; WEST OF ST. GEORGE DRIVE

(STARTS AT 2:00PM ON OCTOBER 26, 1993)



LOCATION C : 500 FEET TO THE EAST OF CAMINO TASSAJARA; NEAR THE JOHNSTON ROAD INTERSECTION

(STARTS AT 3:00PM ON OCTOBER 26, 1993)

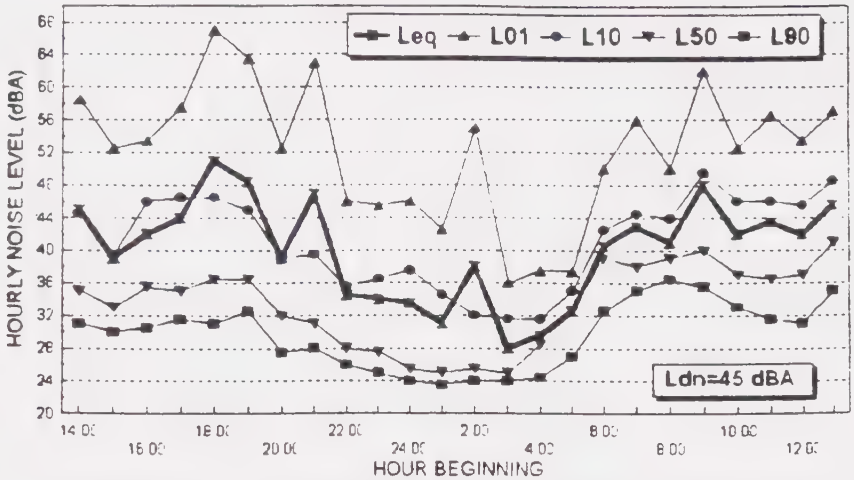


RESULTS OF CONTINUOUS 24-HOUR NOISE MEASUREMENTS

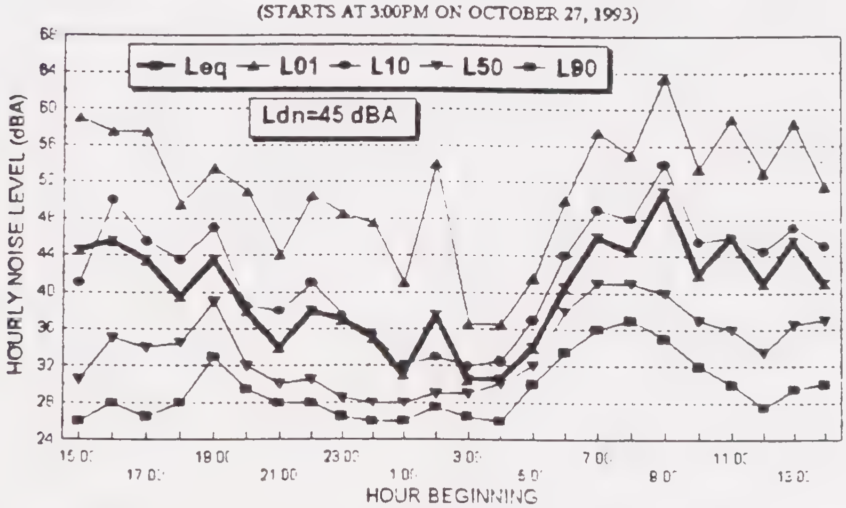
Figure 4.6-3

ILLINGWORTH & RODKIN, INC./Acoustical Engineers

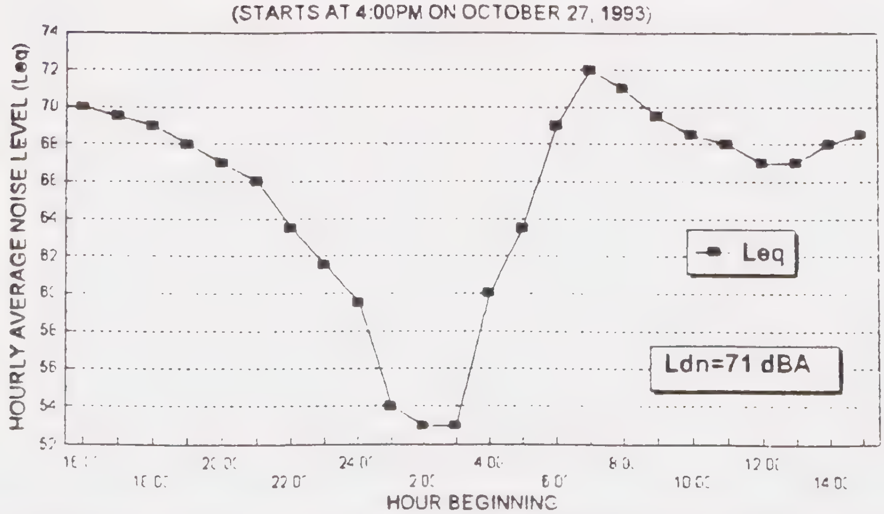
LOCATION D : DR. FORSYTHE'S RESIDENCE;
WEST OF THE SITE; OFF MEADOW LAKE DRIVE
(STARTS AT 2:00PM ON OCTOBER 27, 1993)



LOCATION E : AT THE EXISTING SOUTH END OF LAWRENCE ROAD
(STARTS AT 3:00PM ON OCTOBER 27, 1993)



LOCATION F : 30 FEET FROM THE CENTERLINE OF TASSAJARA ROAD;
NORTH OF GLEASON DR.; IN ALAMEDA COUNTY
(STARTS AT 4:00PM ON OCTOBER 27, 1993)



RESULTS OF CONTINUOUS 24-HOUR NOISE MEASUREMENTS	Figure 4.6-4

ILLINGWORTH & RODKIN, INC./Acoustical Engineers

TABLE 4.6-3
15-MINUTE NOISE MEASUREMENTS
OCTOBER 28, 1993
(see Figure 4.6-2)

Location	Description	Start Time	L_{eq}[1]	L_{01}[2]	L_{10}[2]	L_{50}[2]	L_{90}[2]	Estimated L_{dn}[3]	Comments
1	50 ft. from the center of Dougherty Rd.; south of Crow Canyon Rd.	11:45 am	62	72	66	47	36	63-64	New residential developments 200-300 ft. from the road.
2	106 ft. from the center of Crow Canyon Rd.; east of Indian Rock Rd.	12:10 pm	63	72	67	58	49	64-65	Typical setback of homes of new developments adjacent to the road.
3	75 ft. from the center of Camino Tassajara; west of Alta Vista Way.	12:38 pm	64	73	68	59	50	65-66	Typical setback of residences to the road.
4	100 ft. from the center of Camino Tassajara; east of Crow Canyon Rd.	1:10 pm	60	70	63	58	51	61-62	New residential developments at setbacks of 100-200 ft. from the road.
5	50 ft. from the center of Lawrence Rd.; about 1/2 mile south of Camino Tassajara.	1:45 pm	51	63	53	38	33	51-53	Typical setback of existing residences to Lawrence Rd.
6	75 ft. from the center of Camino Tassajara; at the entrance to the Blackhawk gated community.	2:35 pm	65	73	69	60	48	66-67	Minimum setback of residences of the Blackhawk community to the road.
7	50 ft. from the center of Finley Rd.; 3/4 mile north of Camino Tassajara	2:58 pm	51	65	50	37	32	51-54	Scattered residences at setbacks of 50-200 ft. from Finley Rd.
8	50 ft. from the center of Highland Rd.; about 1 mile east of Tassajara Rd.	3:42 pm	60	72	64	41	33	60-62	Scattered residences at setbacks of 100-300 ft. from Highland Rd.

[1] Leq -- The average A-weighted noise level during the measurement period.

[2] L01, L_{10}, L_{50}, L_{90} -- The A-weighted noise levels that are exceeded during the measurement period 01, 10, 50, and 90 percent of the time, respectively.

[3] Ldn (Day/Night Sound Level) -- A descriptor established by the U.S. Environmental Protection Agency (EPA) for the 24-hour average A-weighted noise level. Sound levels during the hours from 10:00 pm to 7:00 am are penalized 10 dB to account for the increased sensitivity of people during the nighttime hours.

Measurements at Location C were taken approximately 500 feet from Camino Tassajara near the intersection with Johnson Road. This measurement represents the current noise exposure of several residences in the area to traffic from Camino Tassajara. The hourly L_{eq} at this location ranged between 37 and 51 dBA, and the L_{dn} was 51 dBA. The noise of occasional airplanes flying overhead was also included in the measurement but was not significant.

Measurements at Location D were taken at the front yard of Dr. Forsythe's residence. This residence adjoins the site to the west and is accessed off Lawrence Road. Noise levels at this location are currently low due to lack of any significant noise sources in the area. The hourly L_{eq} ranged between 28 and 51 dBA and the L_{dn} was 45 dBA. Such noise levels would be considered typical for existing residences near the project site away from local street traffic.

Measurements at Location E were taken at the southern end of Lawrence Road. Noise levels recorded at this location are typical of the current exposure of several residences along Lawrence Road. Noise levels were influenced by occasional airplane flyovers and occasional vehicles on Lawrence Road. The hourly L_{eq} ranged between 30 and 51 dBA and the L_{dn} was 45 dBA. Such noise levels are considered low and are typical for rural settings.

Measurements at Location F were taken 30 feet from the centerline of Tassajara Road, north of Gleason Drive in Alameda County. This measurement quantifies the maximum current exposure of existing residences along Tassajara Road to traffic noise. The hourly L_{eq} ranged between 53 and 72 dBA and the L_{dn} was 71 dBA. Noise levels at this location were exclusively attributed to traffic on Tassajara Road. Tassajara Road would be a primary access route to the project site.

The results of the 15-minute noise measurements taken in and around the project area are summarized in Table 4.6-3. All 15-minute noise measurements were taken to quantify existing noise levels at current residences in the vicinity of the project. Table 4.6-3 also shows an estimate of the 24-hour average noise level (L_{dn}) at each location derived from data correlation with long-term monitoring locations and existing available traffic data. Existing residences adjacent to Camino Tassajara and Crow Canyon Road are currently exposed to the highest noise levels in the area. Residences along the rest of the streets in and around the project area are currently exposed to lower noise levels since these streets do not currently carry substantial traffic.

IMPACTS AND MITIGATION MEASURES

The potentially significant noise issues associated with the proposed development of Tassajara Valley are:

- the compatibility of the proposed land uses with the noise environment;
- the extent to which project-generated noise would adversely affect long-term noise levels in the area; and
- the extent to which construction activities would substantially increase short-term noise levels locally.

Significance Criteria

CEQA Guidelines (Appendix G) state that a project will normally have a significant effect on the environment if it will:

- conflict with adopted environmental plans and goals of the community where it is located (CEQA Guidelines, Appendix G(a));
- increase substantially the ambient noise levels for adjoining areas (CEQA Guidelines, Appendix G(p));
- expose people to severe noise levels (CEQA Guidelines, Appendix I (II.6.b)).

Noise levels on the site are assessed against noise and land use compatibility guidelines (see Figure 4.6-1) and goals and policies of the Noise Element of the *General Plan* of Contra Costa County, contained in the Regulatory Background section of this report. An adverse impact upon existing and future residents would be considered significant if:

- noise resulting from the project would increase average noise levels (L_{dn}) by more than 3 dBA, and existing average noise levels would increase from below an L_{dn} of 60 dBA to above an L_{dn} of 60 dBA; or,

- noise resulting from the project would increase average noise levels by more than 3 dBA where existing noise levels already exceed an L_{dn} of 60 dBA; or,

- noise resulting from the project would increase average noise levels by at least 5 dBA and the resulting noise levels remain below an L_{dn} of 60 dBA.

These significance criteria recognize:

a. the threshold levels of acceptability established by the Noise Element of the *General Plan* of Contra Costa County;

b. that once the threshold level has been exceeded, any noticeable change above that level (a 3 dBA increase) results in a significant degradation of the noise environment; and

c. that a clearly noticeable change (a 5 dBA increase) in the noise environment, even though the acceptability threshold has not been reached (L_{dn} of 60 dBA), is considered a substantial increase and would result in a significant impact.

All impacts are considered significant adverse impacts unless identified otherwise. The corresponding mitigation measure(s), unless otherwise noted, would be sufficient to reduce impacts to a less-than-significant level. Although not required by CEQA, some less-than-significant impacts

have been discussed because they are issues of local concern. While no mitigation measures are required by CEQA for less-than-significant impacts, in some cases recommendations are proposed that could be considered by staff as conditions of project approval.

Noise and Land Use Compatibility - *General Plan* Policy Compliance

Impact 4.6-1 Proposed noise-sensitive land uses adjacent to major roadways in the project area would be exposed to traffic noise exceeding local guidelines.

The major roadways in the project area would be Camino Tassajara, Highland Road, Johnston Road, Windemere Parkway and the Country Loop Road. The Federal Highway Administration (FHWA) traffic noise prediction model was used to project existing and future noise levels for major roadways in and around the project area. The computer model was calibrated with noise levels measured during the noise monitoring survey. Traffic data was provided by the transportation consultant for the EIR (Barton-Aschman Associates, Inc.).

Existing and future traffic noise levels computed using the model are shown in Table 4.6-4. The left hand column of the table presents the traffic assumptions used in the modeling. They include the average daily traffic (ADT), auto, medium truck and heavy truck speeds (AU, MT, HT) and the percentage of the average daily traffic which are medium trucks and heavy trucks (MT, HT, respectively). The day/night average sound level (L_{dn}) calculated 50 feet from the center of each roadway segment is then provided, as well as the distance in feet to the 60, 65, 70, 75 and 80 dBA L_{dn} noise contour. Table 4.6-4 is particularly useful in determining the compatibility of a particular land use adjacent to a roadway segment. For example, along Camino Tassajara, the segment from Sycamore Valley Road to Crow Canyon Road is characterized by an existing L_{dn} of 70 dBA at a distance of 50 feet from the roadway. It is 275 feet to the 60 L_{dn} contour. In the future, if the project is constructed, the L_{dn} would increase to 72 dBA 50 feet from the centerline of the roadway and the 60 L_{dn} contour would be found at a distance of 399 feet from the centerline of the roadway. The 65 dBA L_{dn} noise contour would be located 235 from the centerline of the roadway. Single-family residential development would, therefore, require approximately a 400-foot setback from the roadway without other mitigation in order to be a compatible land use, whereas multi-family residential development would require a 185-foot buffer distance. Other mitigation measures, such as noise barriers, could of course be used to reduce open space buffer sizes.

The County's exterior noise standard for low density residential land uses is an L_{dn} of 60 dBA. Noise limits of "normal" and "conditional" acceptance for other land uses, adopted by Contra Costa County, are shown in Figure 4.6-1. Multi-family housing is "normally acceptable" in the County in areas exposed to noise levels up to an L_{dn} of 65 dBA. State law, however, in Title 24, Part 2 of the Administrative Code, requires a detailed analysis of the sound insulation for multi-family housing to be located where the L_{dn} would exceed 60 dBA. Schools, libraries, churches and hospitals are "normally acceptable" land uses when exposed to noise levels up to an L_{dn} of 70 dBA. Office, business and commercial land uses are also "normally acceptable" up to an L_{dn} of 70 dBA.

Table 4.6-4 shows that future noise levels on the site would be highest along Camino Tassajara. The *Preliminary Development Plan* (1995) shows residential land uses along Camino Tassajara. Future noise levels along this road, depending on the roadway segment, would range between an L_{dn} of 70 and 75 dBA. Future noise levels along segments of Camino Tassajara outside the project area would exceed an L_{dn} of 60 dBA within 300 to 570 feet and 65 dBA within 140 to 265 feet from the centerline of the roadway. In the absence of sound barriers (e.g., topography), residential land uses adjacent to Camino Tassajara would be significantly affected by traffic noise. Nonresidential land uses along Camino Tassajara Road could also be potentially exposed to excessive noise and considered significantly affected depending on actual setbacks of such land uses from the roadway.

The *Preliminary Development Plan* also shows residential land uses along Highland Road, Johnston Road, a small segment of Windemere Parkway and Country Loop Road, the other major roadways serving the project site. Table 4.6-4 shows that an L_{dn} of 60 dBA would be exceeded up to 300 feet and 265 feet from the centerline of Highland Road and Windemere Parkway, respectively. Future noise levels would also exceed an L_{dn} of 60 dBA up to 100 feet from Country Loop Road. Residential development within the 60-L_{dn} noise contour of these roadways would also be significantly affected by traffic noise.

Developments proposed in areas exposed to traffic noise above limits considered by the County "normally acceptable" must be designed to properly reduce noise. This can be achieved by a combination of architectural and site design measures, or noise barriers and open space buffers.

Implementing special abatement measures and specifications in site planning and in the design of residential units and other noise sensitive structures can achieve an exterior L_{dn} of 60 dBA or less (low density) or 65 dBA (multi-family) and an interior noise level of 45 dBA or less. An L_{dn} below 45 dBA inside new multi-family housing, motels, hotels, hospitals and senior housing is also a state requirement (Title 24, Part 2 of the California Administrative Code). Noise abatement measures could include orientation of balconies or rear yards away from the noise source, placement of non-noise sensitive building elements (garages, storage areas, etc.) between noise source and human occupancy area, and the use of sound-rated components (i.e., windows, doors and walls) in noise affected rooms.

The construction of sound walls or earth berms, or a combination of the two, along major roadways (i.e., Camino Tassajara, Windemere Parkway, Highland Road, Country Loop Road) can also effectively reduce traffic noise at adjacent residential areas. All walls must be airtight and have a minimum surface weight of three pounds per square foot. Preliminary calculations indicate that residences along Camino Tassajara would need to be located 80 to 140 feet from the roadway edge with an eight-foot high sound wall. Along Windemere Parkway, Highland Road, and Country Loop Road sound walls of six to eight feet high would be needed for normal residential setback distances. Earth berms are generally more effective in reducing traffic noise and would be the preferable noise mitigation to retain the rural character of the area. With six- to eight-foot high earth berms, residences along Camino Tassajara would need to be set back 60 to 100 feet from the roadway edge. A combination of earth berms and/or increased setbacks from the roadway can be used to effectively reduce traffic noise and offer a more aesthetically pleasing development. The effectiveness of all of the above mitigation measures in reducing noise to an acceptable level would have to be assessed on a project-by-project basis.

TABLE 4.6-4

EXISTING AND FUTURE WITH PROJECT TRAFFIC NOISE CONTOUR DISTANCES

	ADT*	SPEED AU	SPEED MT	SPEED HT	TRUCK% MT	TRUCK% HT	Ldn @ 50'	Ldn NOISE CONTOUR DISTANCE(FEET) 80	75	70	65	60
1 ALCOSTA BLVD.												
FROM: Bollinger Canyon												
EXISTING	16,000	40	40	40	1.0	1.0	69	0	0	42	121	260
FUTURE	16,800						69	0	0	44	124	268
TO: Montevideo												
FROM: Montevideo												
EXISTING	7,750	40	40	40	1.0	1.0	66	0	0	0	64	160
FUTURE	10,700						67	0	0	28	88	199
TO: Old Ranch												
FROM: Old Ranch												
EXISTING	4,400	40	40	40	1.0	1.0	64	0	0	0	36	110
FUTURE	7,100						66	0	0	0	59	151
TO: Village Pkwy.												
2 BLACKHAWK RD.												
FROM: Mt. Diablo Scenic Blvd.												
EXISTING	7,300	40	40	40	1.0	1.0	66	0	0	0	60	154
FUTURE	16,500						69	0	0	43	123	265
TO: Blackhawk Dr.												
FROM: Blackhawk Dr.												
EXISTING	11,400	40	40	40	1.0	1.0	68	0	0	30	94	207
FUTURE	19,200						70	0	0	50	136	293
TO: Camino Tassajara												
3 BOLLINGER CANYON RD.												
FROM: Alcosta												
EXISTING	6,650	40	40	40	1.0	1.0	65	0	0	0	55	145
FUTURE	40,700						73	0	34	104	225	484
TO: Dougherty												
FROM: Dougherty												
EXISTING	1,000	40	40	40	1.0	1.0	57	0	0	0	0	26
FUTURE	43,300						74	0	36	109	234	504
TO: New Rd.												
FROM: New Rd.												
EXISTING	1,000	40	40	40	1.0	1.0	57	0	0	0	0	26
FUTURE	33,300						72	0	28	87	196	423
TO: East Ranch												
FROM: East Ranch												
EXISTING	1,000	40	40	40	1.0	1.0	57	0	0	0	0	26
FUTURE	27,800						72	0	0	73	174	375
TO: Windemere												
4 CAMINO TASSAJARA RD.												
FROM: Sycamore Valley												
EXISTING	13,000	45	45	45	1.0	1.0	70	0	0	45	127	275
FUTURE	22,800						72	0	25	80	185	399
TO: Crow Canyon												

* ADT - Average daily trips; AU - Autos; MT - Medium trucks; HT - Heavy trucks

Table 4.6-4 *continued*

	ADT*	SPEED AU	SPEED MT	SPEED HT	TRUCK% MT	TRUCK% HT	Ldn @ 50'	Ldn NOISE CONTOUR DISTANCE (FEET) 80	75	70	65	60
4 CAMINO TASSAJARA RD.												
FROM: Crow Canyon												
EXISTING	11,000	45	45	45	1.0	1.0	69	0	0	38	114	246
FUTURE	38,500						74	0	43	122	263	566
TO: Lawrence												
FROM: Lawrence												
EXISTING	9,900	45	45	45	1.0	1.0	68	0	0	35	106	229
FUTURE	33,800						74	0	37	112	241	519
TO: Blackhawk Dr.												
FROM: Blackhawk Dr.												
EXISTING	7,300	45	45	45	1.0	1.0	67	0	0	26	81	187
FUTURE	15,300						70	0	0	54	142	306
TO: Finley												
FROM: Finley												
EXISTING	6,800	45	45	45	1.0	1.0	67	0	0	0	75	178
FUTURE	15,000						70	0	0	52	140	302
TO: Johnston												
FROM: Johnston												
EXISTING	6,250	45	45	45	1.0	1.0	66	0	0	0	69	168
FUTURE	18,200						71	0	0	64	159	344
TO: Highland												
FROM: Highland												
EXISTING	1,900	45	45	45	2.0	2.0	62	0	0	0	25	79
FUTURE	13,900						71	0	0	58	150	323
TO: Windemere												
FROM: Windemere												
EXISTING	1,900	50	50	50	2.0	2.0	63	0	0	0	32	101
FUTURE	23,700						74	0	40	117	251	541
TO: County Line												
5 COUNTRY LOOP RD.												
FROM: Camino Tassajara												
EXISTING	1,000	30	30	30	1.0	1.0	54	0	0	0	0	0
FUTURE	7,400						63	0	0	0	31	99
TO: Johnston												
FROM: Johnston												
EXISTING	1,000	30	30	30	1.0	1.0	54	0	0	0	0	0
FUTURE	2,800						59	0	0	0	0	37
TO: Highland												
FROM: Highland												
EXISTING	1,000	30	30	30	1.0	1.0	54	0	0	0	0	0
FUTURE	3,000						59	0	0	0	0	40
TO: Camino Tassajara												

* ADT - Average daily trips; AU - Autos; MT - Medium trucks; HT - Heavy trucks

Table 4.6-4 *continued*

	ADT*	SPEED AU	SPEED MT	SPEED HT	TRUCK% MT	TRUCK% HT	Ldn @ 50'	Ldn NOISE CONTOUR DISTANCE(FEET) 80	75	70	65	60
6 CROW CANYON RD.												
FROM: Camino Tassajara												
EXISTING	10,150	40	40	40	2.0	2.0	68	0	0	33	102	220
FUTURE	47,400						75	0	48	132	285	615
TO: Dougherty												
FROM: Dougherty												
EXISTING	9,000	40	40	40	2.0	2.0	68	0	0	29	92	203
FUTURE	31,200						73	0	32	100	216	465
TO: Shoreline Dr.												
FROM: Shoreline Dr.												
EXISTING	14,650	40	40	40	2.0	2.0	70	0	0	47	130	281
FUTURE	34,100						73	0	35	106	229	494
TO: Alcosta												
7 DOUGHERTY RD.												
FROM: Crow Canyon												
EXISTING	2,680	45	45	45	1.0	1.0	63	0	0	0	30	94
FUTURE	42,200						75	0	47	130	279	602
TO: Bollinger Canyon												
FROM: Bollinger Canyon												
EXISTING	2,600	45	45	45	1.0	1.0	63	0	0	0	29	91
FUTURE	17,000						71	0	0	59	152	328
TO: Windemere												
FROM: Windemere												
EXISTING	2,600	45	45	45	1.0	1.0	63	0	0	0	29	91
FUTURE	31,800						73	0	35	107	231	498
TO: Old Ranch												
FROM: Old Ranch												
EXISTING	5,100	45	45	45	1.0	1.0	66	0	0	0	56	147
FUTURE	27,100						73	0	30	95	208	448
TO: County Line												
8 HIGHLAND RD.												
FROM: Camino Tassajara												
EXISTING	4,600	50	50	50	1.0	1.0	66	0	0	0	66	164
FUTURE	11,400						70	0	0	52	139	301
TO: Collier Canyon												
FROM: Collier Canyon												
EXISTING	4,050	50	50	50	1.0	1.0	66	0	0	0	59	151
FUTURE	10,000						70	0	0	46	128	275
TO: Livermore Ave.												
9 LAWRENCE RD.												
FROM: Camino Tassajara												
EXISTING	1,000	30	30	30	1.0	0.0	54	0	0	0	0	0
FUTURE	3,300						59	0	0	0	0	44
TO: New Road to the Site												

* ADT - Average daily trips; AU - Autos; MT - Medium trucks; HT - Heavy trucks

Table 4.6-4 *continued*

	ADT*	SPEED AU	SPEED MT	SPEED HT	TRUCK% MT	TRUCK% HT	Ldn @ 50′	Ldn NOISE CONTOUR DISTANCE (FEET) 80	75	70	65	60
10 OLD RANCH RD.												
FROM: Alcosta												
EXISTING	3,600	35	35	35	1.0	1.0	61	0	0	0	0	68
FUTURE	13,100						67	0	0	0	79	184
TO: Dougherty												
11 TASSAJARA RD.												
FROM: County Line												
EXISTING	1,900	50	50	50	2.0	2.0	63	0	0	0	32	101
FUTURE	27,145						75	0	46	128	275	592
TO: I-580												
12 WINDEMERE PKWY.												
FROM: Dougherty												
EXISTING	1,000	35	35	35	1.0	1.0	56	0	0	0	0	0
FUTURE	16,500						68	0	0	31	99	214
TO: Bollinger Canyon												
FROM: Bollinger Canyon												
EXISTING	1,000	35	35	35	1.0	1.0	56	0	0	0	0	0
FUTURE	22,400						69	0	0	43	122	263
TO: Camino Tassajara												

* ADT - Average daily trips; AU - Autos; MT - Medium trucks; HT - Heavy trucks

The Tassajara Design Guidelines incorporate noise mitigation measures. In the Village Centers, the Design Guidelines recommend retail storefronts along the major streets to buffer adjacent residential areas from the traffic noise. This is an important site planning feature. The higher density residential proposed above the retail shops would be a compatible land use, provided that noise control treatments are incorporated into the buildings themselves and balconies and other private open space are located on the shielded side of the building away from the major street. The Design Guidelines show a variety of different types of neighborhoods. Some neighborhoods are shown adjacent to major roadways with a landscaped strip separating the roadway from the rear yards of homes. This area could include a berm or soundwall as discussed above. The Design Guidelines specify a soundwall or privacy fence with a maximum height of eight feet. For situations requiring a noise barrier more than eight feet in height, possible design solutions include an earthen berm or a combination of setback from the roadway and a berm wall. This would provide the type of noise reduction necessary for residential development proposed along Camino Tassajara. If a maximum height of eight feet above curb is required as specified on page 49 of the Design Guidelines, then a sufficient setback from the roadway edge is required to provide the additional noise reduction necessary to meet County guidelines. This would have to be evaluated on a case-by-case basis.

Mitigation Measures

All of the following mitigation measures are required to reduce the impact of traffic noise to a less-than-significant level.

4.6-1(a) Special noise abatement measures and specifications in site planning and in the design of residential units and other noise sensitive structures exposed to high noise levels as discussed above should be implemented to achieve exterior L_{dn} of 60 dBA or less (low density) or 65 dBA (multi-family), and an interior noise level of 45 dBA or less.

4.6-1(b) Walls or earth berms, or a combination of the two, should be constructed along major roadways (i.e., Camino Tassajara Road, a portion of Windemere Parkway, Highland Road, Country Loop Road) to effectively reduce traffic noise at adjacent residential areas. The soundwalls would need to be constructed airtight and have a minimum surface weight of three pounds per square foot. Suitable construction materials would include masonry block, precast masonry or concrete panels, or wood if properly detailed.

Secondary Impact

Loss of views to the open space areas. Visual impacts are discussed in Section 4.8.

4.6-1(c) Subsequent detailed noise assessments would be required for residential development exposed to an L_{dn} of 60 dBA or higher as required by County Planning Guidelines and Title 24, Part 2 of the California Administrative Code (for multi-family housing). These studies would be

conducted on a project-by-project basis and would be done prior to the granting of a building permit. These detailed studies are beyond the scope of this report because they require final site and grading plans, and building plans.

Other Noise

Impact 4.6-2 Noise generated by proposed retail and commercial projects could expose existing and future noise sensitive receptors to excessive noise.

The proposed development would include retail and commercial establishments, such as a shopping center, neighborhood stores, as well as office and professional space. Such land uses could be located near noise sensitive receptors, such as schools and residences. Parking lot and mechanical equipment noise, as well as their hours of operation, could potentially expose nearby sensitive receptors to excessive noise. Noise associated with such activities would be considered a potentially significant impact. However, at this level of planning, detailed mitigation measures cannot be formulated and are more appropriately deferred to the project design stage.

Mitigation Measures

The following mitigation measures are required to reduce commercial generated noise impacts to a less-than-significant level.

4.6-2(a) Retail and commercial projects proposed to be located adjacent to existing residential areas should not exceed the noise limits on the residential property boundaries as outlined below:

- *average hourly noise level of 55 dBA during daytime hours and 45 dBA during nighttime hours; or*

- *if the ambient noise level already exceeds the above limits, project noise should not increase the ambient by more than 5 dBA, the minimum change required for any noticeable change in community response to occur.*

4.6-2(b) The County should require a design level acoustical assessment for future applications of commercial development that would be located adjacent to existing residential areas and have the potential to increase ambient noise levels.

Project-Generated Noise

Impact 4.6-3 Existing noise sensitive receptors along segments of Camino Tassajara would experience a substantial increase in traffic noise.

TABLE 4.6-5
PROJECT-RELATED TRAFFIC NOISE LEVEL INCREASES

Roadway	Noise Level Increase (dBA)
ALCOSTA BOULEVARD	1
BLACKHAWK ROAD	0
BOLLINGER CANYON ROAD	
Alcosta-New Road	1
New Road-Windemere	1
CAMINO TASSAJARA	
Sycamore Valley-Crow Canyon	0
Crow Canyon-Lawrence	2
Lawrence-Blackhawk	3
Blackhawk-Finley	0
Finley-Johnston	0
Johnston-Highland	1
Highland-Windemere	5
Windemere-County Line	2
CROW CANYON ROAD	
Camino Tassajara-Dougherty	1
Dougherty-Alcosta	1
DOUGHERTY ROAD	
Crow Canyon-Bollinger Canyon	1
Bollinger Canyon-Windemere	1
Windemere-Old Ranch	0
Old Ranch-County Line	0
HIGHLAND ROAD	0
LAWRENCE ROAD	0
OLD RANCH	0
TASSAJARA ROAD	
County Line-I580	1
WINDEMERE PARKWAY	
Dougherty-Bollinger Canyon	1
Bollinger Canyon-Tassajara	2

Proposed development in the Tassajara Valley would introduce additional traffic on the existing street network which would result in higher traffic noise levels. Future noise levels and noise contour distances for streets in and around the project area, with and without the project, are included in Appendix D. Based on these noise levels, a summary of project-generated traffic noise level increases along various street segments are shown in Table 4.6-5. The table shows that future noise levels along major roadways in and around the project area as a result of this project would generally increase between 1 and 2 dBA. This would not be a substantial increase. Project-generated traffic would increase noise levels by 3 dBA along Camino Tassajara between Lawrence Road and Blackhawk Drive, and by 5 dBA along Camino Tassajara between Highland Road and Windemere Parkway. Since noise level increases above 3 dBA are considered significant, these increases would cause significant noise impacts at these residences.

Individual homes which adjoin these sections of Camino Tassajara Road would most likely be removed as development proceeds. Mitigation measures are recommended for residences which would remain as a part of the future development.

Existing residences along Finley Road, Bruce Drive, Johnston Road, Lawrence Road and Highland Road are currently exposed to low noise levels due to light traffic on these roadways. Noise levels along these roadways due to project traffic would not increase substantially.

Mitigation Measure

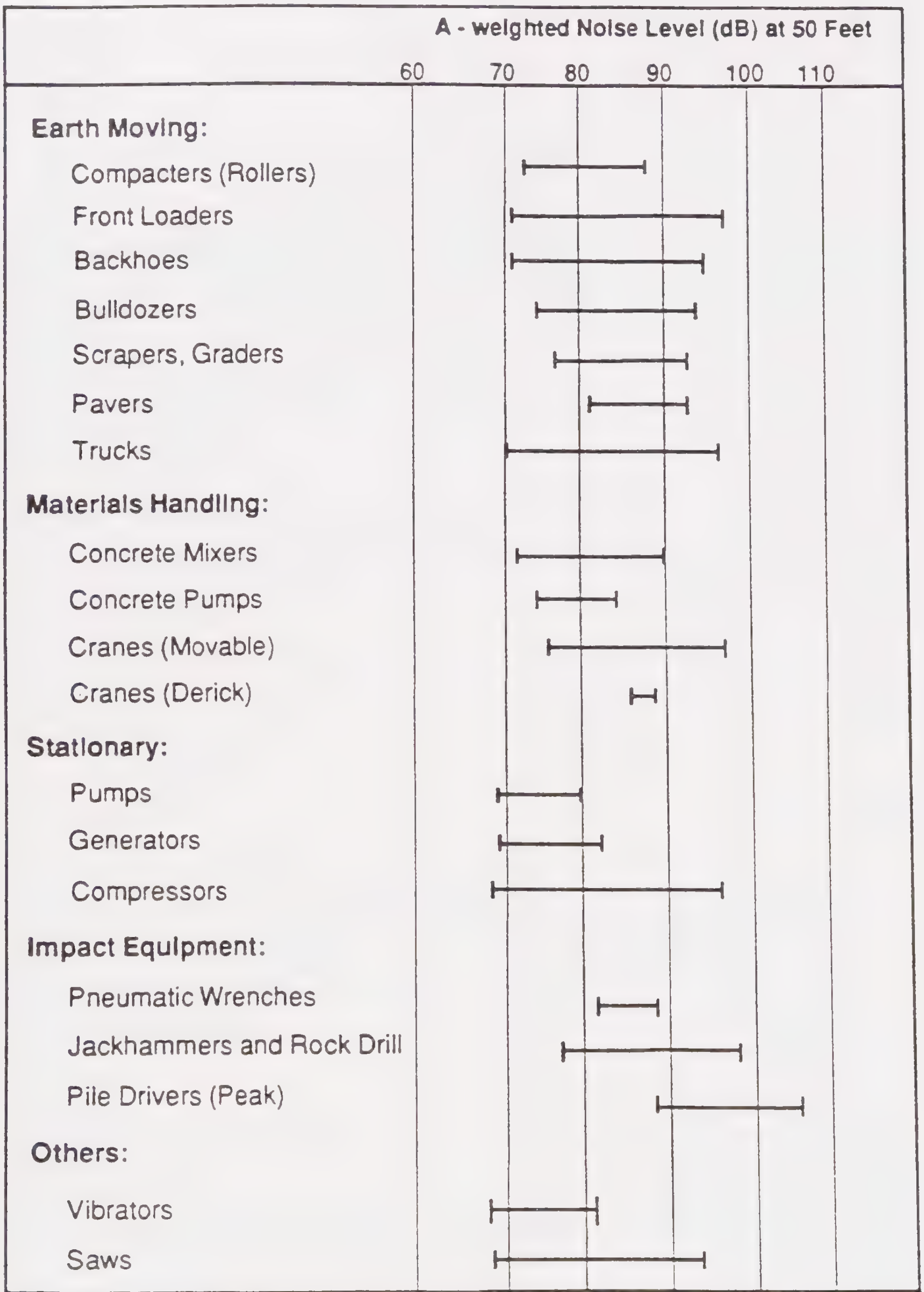
4.6-3 *Mitigation measures for the existing residences along the segment of Camino Tassajara between Highland Road and Windemere Parkway, which would remain as development proceeds, include sound barriers to protect outdoor use areas facing the road. These barriers would need to be evaluated on a case-by-case basis in conjunction with the property owners to determine their feasibility and desirability at the individual properties. Options include masonry or concrete walls, wood fences, berms or some combination of these.*

Secondary Impact

Depending upon setback, soundwalls or a combination of berm/wall could block views of the hills/open space areas.

Construction Noise Impacts

Impact 4.6-4 Significant short-term noise impacts on residential areas adjacent to construction sites would be expected during heavy periods of construction activity.



Source: Handbook of Noise Control, Cyril M. Harris, 1979

CONSTRUCTION EQUIPMENT
NOISE LEVEL RANGE

Figure 4.6-5

ILLINGWORTH & RODKIN, INC./Acoustical Engineers

Noise would also be generated during project related construction activities. Construction activities would include ground clearing, development of the new infrastructure, excavation and foundation work, erection of new buildings and finishing work. The types of construction equipment used for this type of project and the range of maximum noise levels that each piece of equipment generates at 50 feet is shown in Figure 4.6-5. Average noise levels generated during the various phases of construction of similar projects are shown in Table 4.6-6.

TABLE 4.6-6

TYPICAL RANGES OF ENERGY EQUIVALENT NOISE LEVELS, L_{eq} IN dBA, AT CONSTRUCTION SITES

	Domestic Housing		Office Building, Hotel, Hospital, School, Public Works		Industrial Parking Garage, Religious Amusement & Recreations, Store, Service Station		Public Works Roads & Highways, Sewers, and Trenches	
	I	II	I	II	I	II	I	II
Ground Clearing	83	83	84	84	84	83	84	84
Excavation	88	75	89	79	89	71	88	78
Foundations	81	81	78	78	77	77	88	88
Erection	81	65	87	75	84	72	79	78
Finishing	88	72	89	75	89	74	84	84

I - All pertinent equipment present at site.
II - Minimum required equipment present at site.

Source: USEPA, Legal Compilation on Noise, Vol. 1, p. 2-104, 1973.

Construction is scheduled to take place over a period of several years and would involve building in various zones of the project area. Existing residences in and around the perimeter of the project site would be occasionally exposed to high noise levels during heavy periods of construction nearby. Since details about the construction schedule are not currently available, specific noise impacts resulting from construction activities cannot be quantified at the present time. However, construction activities during various phases would produce occasionally high noise levels and would result in short-term significant noise impacts on adjacent noise sensitive land uses.

Mitigation Measures

4.6-4 *Project-related construction period noise impacts can be reduced to a less-than-significant level with implementation of the following conditions:*

- *Limit noise generating construction activities, including truck traffic to and from the site to daytime hours (7:30 AM to 5:00 PM) during weekdays.*
- *Properly muffle and maintain all construction equipment powered by internal combustion engines.*
- *Prohibit unnecessary idling of internal combustion engines.*
- *Locate all stationary noise generating construction equipment, such as air compressors and portable power generators, as far as practical from existing noise sensitive land uses.*
- *Select "quiet" construction equipment whenever possible, such as air compressors with special housings and mufflers. All internal combustion engine driven equipment should be fitted with noise suppression devices, such as mufflers and engine enclosures, which provide noise attenuation equal to or greater than the manufacturer's original equipment.*
- *Notify nearby residents of the construction schedule in writing.*
- *Designate a noise disturbance coordinator responsible for responding to any local complaints regarding construction noise. This person shall be responsible for developing and implementing a mitigation monitoring program. Post the name, title and telephone number of the noise disturbance coordinator conspicuously at the construction sites. Persons residing within 500 feet of construction activities should be notified.*

4.7 AIR QUALITY

SETTING

Air Basin Characteristics

The project site is located in hilly terrain east of the San Ramon Valley and north of the Livermore-Amador Valley. These two valleys form small subregional air basins distinct from the larger Bay Area Air Basin. The San Ramon Valley and Livermore-Amador Valley are surrounded on all sides by high hills or mountains. The only significant break in the east bay hills west of the site is Niles Canyon, several miles south of the project site.

The terrain of the project area influences both the climate and air pollution potential. As an inland, protected valley, the project area has generally lighter winds and a higher frequency of calm conditions when compared to the greater Bay Area.

The occurrence of episodes of high atmospheric stability, known as inversion conditions, severely limits the ability of the atmosphere to disperse pollutants vertically. Inversions can be found during all seasons in the Bay Area, but are particularly prevalent in the summer months when they are present about 90 percent of the time in both morning and afternoon.

The project area is generally downwind of the greater Bay Area and, therefore, is subject to pollutants transported to the area by prevailing winds.

The terrain, meteorological characteristics and downwind location of the project area give it a high potential for air pollution, particularly for photochemical pollutants.

Air Quality Standards

The Mulford-Carrell Act of 1969 and the Clean Air Act of 1970 established state and federal air quality standards for several pollutants. These standards are divided into primary standards, designed to protect the public health, and secondary standards, intended to protect the public welfare from effects such as visibility reduction, soiling, nuisance and other forms of damage. The state and federal ambient air quality standards are shown in Table 4.7-1. The State standards are generally more stringent than the federal standards, particularly for ozone and PM-10 (particulate matter, 10 microns).

TABLE 4.7-1
FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	Federal Primary Standard	State Standard
Ozone	1-hour	0.12 PPM	0.09 PPM
Carbon Monoxide	8-hour	9.0 PPM	9.0 PPM
	1-hour	35.0 PPM	20.0 PPM
Nitrogen Dioxide	Annual	0.05 PPM	---
	1-hour	---	0.25 PPM
Sulfur Dioxide	Annual	0.03 PPM	---
	24-hour	0.14 PPM	0.04 PPM
	1-hour	---	0.25 PPM
Particulates	AGM	50 ug/m3	30 ug/m3
	24-hour	150 ug/m3	50 ug/m3
Lead	30-day avg.	---	1.5 ug/m3
	3-month avg.	1.5 ug/m3	---

AGM = Annual Geometric Mean
PPM = Parts Per Million
ug/m3 = Micrograms Per Cubic Meter

Pollutant Characteristics

Of the pollutants shown in Table 4.7-1, ozone and PM-10 are most serious problems southern Contra Costa County. Carbon monoxide is not currently a problem in this part of the air basin, but could become a problem if traffic volumes and congestion increase sufficiently. The following is a description of the characteristics and sources of these problem pollutants.

Ozone

Ozone is the most prevalent of a class of photochemical oxidants formed in the urban atmosphere. The creation of ozone is a result of a complex chemical reactions between hydrocarbons and oxides of nitrogen in the presence of sunshine. Unlike other pollutants, ozone is not released directly into the atmosphere from any sources. The major sources of oxides of nitrogen and hydrocarbons, known as ozone precursors, are combustion sources, such as factories and automobiles, and evaporation of solvents and fuels.

The health effects of ozone are eye irritation and damage to lung tissues. Ozone also damages some materials such as rubber, and may damage plants and crops.

PM-10

PM-10 (particulate matter, 10 microns or less in diameter) consists of solid and liquid particles of dust, soot, aerosols and other matter which are small enough to remain suspended in the air for a long period of time. A portion of the suspended particulate matter in the air is due to natural sources, such as wind blown dust and pollen. Man-made sources include grading operations, fireplace emissions, vehicle emissions, field burning, factories and wind erosion of disced fields, and unpaved roads.

The effects of high concentrations on humans include aggravation of chronic disease and heart/lung disease symptoms. Non-health effects include reduced visibility and soiling of surfaces.

Carbon Monoxide

Carbon monoxide is an odorless, colorless gas that is highly toxic. It is formed by the incomplete combustion of fuels, and its main source in the Bay Area is automobile emissions and other internal combustion engines. As a result, high concentrations of carbon monoxide are typically found very close to major roadways and intersections.

The rate of emission of carbon monoxide from automobiles is dependent on operating conditions. Congested traffic, with long idling times and slow speeds, creates far more carbon monoxide than free-flowing traffic. The term "hot spot" is often used to describe an area of high concentration near a surface intersection or freeway interchange.

Carbon monoxide's health effects are related to its affinity for hemoglobin in the blood. At high concentrations, carbon monoxide reduces the amount of oxygen in the blood, causing heart difficulties in people with chronic diseases, reduced lung capacity and impaired mental abilities.

Attainment Status and Regional Air Quality Plans

The Federal Clean Air Act and the California Clean Air Act of 1988 require that the State Air Resources Board, based on air quality monitoring data, designate portions of the state where the federal or state ambient air quality standards are not met as "nonattainment areas." Because of the differences between the national and state standards, the designation of nonattainment areas is different under the federal and state legislation.

The Bay Area was recently redesignated by the U.S. Environmental Protection Agency "maintenance area" for ozone. The "Urbanized Area" of the air basin is considered nonattainment for carbon monoxide (however, a request for redesignation to "maintenance area" has been submitted to the U.S.

Environmental Protection Agency). The air basin is an attainment area or is unclassified for all other national ambient air quality standards.

Under the California Clean Air Act, the entire San Francisco Bay Air Basin is a nonattainment area for ozone and PM-10. The air basin is either attainment or unclassified for other pollutants.

The California Clean Air Act requires local air pollution control districts to prepare air quality attainment plans. These plans must provide for district-wide emission reductions of five percent per year averaged over consecutive three-year periods or, if not, provide for adoption of "all feasible measures on an expeditious schedule." The Act also grants air districts explicit statutory authority to adopt indirect source regulations and transportation control measures, including measures to encourage or require the use of ridesharing, flexible work hours or other measures which reduce the number or length of vehicle trips.

The current area-wide plan required by the California Clean Air Act was adopted in December 1994 (BAAQMD, 1994). The Plan proposes the imposition of controls on stationary sources (factories, power plants, industrial sources, etc.) and Transportation Control Measures designed to reduce emissions from automobiles. Since the Plan does not provide for a 5 percent annual reduction in emissions, it proposes the adoption of "all feasible measures on an expeditious schedule."

Current and Future Air Quality

The Bay Area Air Quality Management District operates a network of air monitoring sites within the Bay Area Air Basin. The closest to the project site are located in Concord (about 12 miles northwest of the project site) and in Livermore (about 10 miles southeast of the project site). Table 4.7-2 shows a summary of air quality data for these monitoring sites for the period 1990-1994. The number of days exceeding the ozone and PM-10 standards are shown. No violations were recorded at either station for other pollutants (carbon monoxide, sulfur dioxide, nitrogen dioxide).

The *Bay Area '94 Clean Air Plan* forecasts continued improvement in regional air quality into the future. However, projections do not indicate attainment of the state ozone standard even by the year 2000. The current plan addresses ozone only; PM-10 will be addressed in a future update of the plan.

IMPACTS AND MITIGATION MEASURES

Significance Criteria

The project would have a significant impact on air quality if it will:

1. Violate any ambient air quality standard, contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations (CEQA Guidelines, Appendix G (x)).

TABLE 4.7-2
SUMMARY OF AIR QUALITY DATA FOR LIVERMORE AND CONCORD, 1990 - 1994

Pollutant	Standard	Monitoring Site	1990	1991	1992	1993	1994
Ozone	State 1-hour	Livermore	8	17	14	7	5
		Concord	3	4	3	7	4
Ozone	Federal 1-hour	Livermore	1	1	0	1	2
		Concord	0	0	0	2	0
PM-10	State 24-hour	Livermore	10	12	5	3	4
		Concord	6	13	8	2	4
PM-10	Federal 24-hour	Livermore	0	1	0	0	0
		Concord	0	0	0	0	0

Source: ARB, 1991-1994; BAAQMD, 1995.

2. Result in substantial emissions or deterioration of ambient air quality (CEQA Guidelines, Appendix I (II.2.a)). The significance thresholds recommended by the Bay Area Air Quality Management District are considered to represent "substantial" emissions. These thresholds are 150 pounds per day for all regional air quality pollutants except carbon monoxide. The significance threshold for carbon monoxide is 550 pounds per day, although exceedance of this threshold only triggers the need for estimates of carbon monoxide "hot spot" concentrations (BAAQMD, 1985).

3. Create objectionable odors (CEQA Guidelines, Appendix I (II.2.b)).

4. Alter air movement, moisture, or temperature, or result in any change in climate, either locally or regionally (CEQA Guidelines, Appendix I (II.2.c)).

All impacts are considered significant adverse impacts unless identified otherwise. The corresponding mitigation measure(s), unless otherwise noted, would be sufficient to reduce impacts to a less-than-significant level. Although not required by CEQA, some less-than-significant impacts have been discussed because they are issues of local concern. While no mitigation measures are required by CEQA for less-than-significant impacts, in some cases recommendations are proposed that could be considered by staff as conditions of project approval.

Impact 4.7-1 Construction activities would generate PM-10 and dust, creating the potential for nuisance.

Construction activities are a minor source of gaseous emissions. Solvents in adhesives, non-waterbase paints, thinners, some insulating materials and caulking materials would evaporate in the atmosphere and would participate in the photochemical reaction that creates urban ozone. Asphalt used in paving is also a source of organic gases for a short time after its application.

The most substantial construction air quality impacts would be due to dust generated by equipment and vehicles. Fugitive dust is emitted both during construction activity and as a result of wind erosion over exposed earth surfaces. Clearing, grading and earthmoving activities comprise the major source of construction dust emissions, but traffic and general disturbance of the soil also generate dust emissions.

The effects of construction activities would be increased dustfall and locally elevated levels of PM-10 near the site of construction activity. Depending on the weather, soil conditions, the amount of activity taking place and nature of dust control efforts, these impacts could affect existing land uses near the project or previously completed portions of the project site.

Without mitigation, project construction impacts are considered to be a temporary, but potentially significant impact within a localized area.

Mitigation Measures

All of the following mitigation measures are required to reduce construction-related impacts to a less-than-significant level.

4.7-1(a) *Minimum dust control standards should be established for all construction occurring within the project area. Conditions of approval should specify that the disturbed portions of the construction site would be watered twice per day to reduce dust emissions. On particularly windy days, the site would be watered more frequently, as needed. In addition, stockpiles of soil, sand, and other such materials would be covered when not being used; a 15 mile per hour speed limit would be enforced on unpaved surfaces; trucks hauling debris, construction materials or earth would be covered; and streets surrounding construction sites would be swept at least once daily. Contractors should be required to appoint a dust control monitor to oversee implementation of these measures.*

4.7-1(b) *Exposed areas should be seeded, treated with soil binders, or paved as soon as possible to minimize wind-blown dust generation.*

4.7-1(c) *Construction trucks should be prevented from idling longer than two minutes to the extent feasible.*

4.7-1(d) *Electrical rather than diesel or gasoline-powered equipment should be used where feasible.*

4.7-1(e) *All operational heavy equipment should be kept in good working order to reduce emissions and minimize the leakage of oils and fuels.*

Secondary Impacts

The use of dust suppressants or soil binders could marginally affect the quality of storm runoff from construction areas. However, amounts of materials used are small, and they are typically used in the dry season when soil moisture is low and rainfall scant.

Mitigation Measures

4.7-1(f) *Use of dust suppressants should be required for locations where water quality is a concern. There are several commercially available dust suppressants with minimal water quality effects.*

Impact 4.7-2 New emissions generated by the project would cause a deterioration in regional air quality. Project emissions would exceed the BAAQMD's significance criteria by a factor of five. This is a significant unavoidable impact.

Development of the project site would impact regional air quality. The effect of development would be primarily indirect; i.e., related to vehicle trips attracted to or generated by residential, commercial, and other land uses.

Project-related automobile emissions have been calculated using the URBEMIS-5 computer program developed by the California Air Resources Board (Air Resources Board, 1995). The incremental daily emission associated with project-related traffic is shown in Table 4.7-3 for reactive hydrocarbons and oxides of nitrogen (two precursors of ozone), PM-10 and sulfur dioxide. A description of the URBEMIS-5 model and the assumptions made in its use are included in Appendix E. The URBEMIS-5 program reflects all current and planned vehicular emission control measures, including oxygenated and reformulated fuel requirements.

Daily emissions associated with proposed residential uses are also shown in Table 4.7-3. Residential uses include a number of dispersed and intermittent sources of pollutants, such as space and water heaters, household paints and solvents, fireplaces and woodstoves, lawn mowers and other equipment.

Guidelines for the evaluation of project impacts issued by the Bay Area Air Quality Management District consider emission increases to be significant if they exceed 150 lbs per day for regional pollutants (BAAQMD, 1985). Project emissions shown in Table 4.7-3 would exceed the criterion for three of four pollutants, so the project is considered to have a significant affect on regional air quality.

TABLE 4.7-3
PROJECT-RELATED REGIONAL EMISSION INCREASES, IN POUNDS PER DAY

	ROG	NOx	PM-10	SOx
Vehicles	398	667	137	92
Residential Sources	340	68	22	4
Total	738	735	159	96
BAAQMD Significance Threshold	150	150	150	150

ROG = Reactive organic gases
NOx = Nitrogen oxides
PM-10 = Particulate matter, 10 micron
SOx = Sulfur oxides

Although the following mitigation measures that are a part of the proposed project or recommended by this report would be able to reduce project impacts on regional air quality by 10 to 20 percent, there is currently no practical way to reduce impacts by over 80 percent to bring project impacts below the BAAQMD significance thresholds. Therefore, the project's impacts on regional air quality are considered a significant and unavoidable adverse impact.

Mitigation Measures

Although mitigation measures will not reduce the impact to a less-than-significant level, all of the following mitigation measures should be required to help reduce the level of impact.

4.7-2(a) *Section 4.5 of this report (Traffic and Circulation) identifies roadway improvements, intersection improvements and other transportation improvements designed to improve levels of service. These improvements would, in general, have a positive effect on emissions from automobiles by reducing vehicle delay.*

4.7-2(b) *The Tassajara Design Guidelines incorporate several features, described below, that can be used to promote alternative modes of travel, thereby reducing air quality impacts:*

- *Transit stops located at Village Center commercial areas can provide a convenient interface for all transit modes. Provide transit information centers and appropriate shelters and other amenities.*

- *Bikeways should be provided along major roadways and through open space areas to connect residences to the commercial centers. Commercial centers, transit stops and recreational facilities within the site should have adequate and secure bicycle parking areas.*

- *Pedestrian paths should be provided connecting residences to commercial centers and recreation facilities.*

- *A telecommuting center within the project should be provided to give residents services of a large-scale business within walking or bicycling distance from their homes.*

- *A Park-and-Ride opportunity should be provided within a two-mile drive of every residence. Park-and-Rides must be designed with adequate lighting and visibility.*

- *Park-and-Ride facilities should have a place for autos or taxis to drop off passengers (Kiss-and-Ride) separate from the bus zone.*

4.7-2(c) *The Preliminary Development Plan incorporates a variety of design strategies intended to reduce the need for vehicle trips, including:*

- *Mixed-used Village Centers provide neighborhood commercial uses.*

- *On-site commercial, recreational, and employment-generating uses are provided.*

- *Higher-density residential and other uses in proximity to the Village Center commercial core and transit centers are clustered.*

4.7-2(d) *The following measures should be incorporated into the project:*

- *Restrict the number of fireplaces in residences, or require residential use of EPA-certified woodstoves, pellet stoves or fireplace inserts; or the use of natural gas-fired fireplaces should be encouraged.*

- *Require outdoor outlets at residences to allow use of electrical lawn and landscape maintenance equipment.*

- *Make natural gas available in residential backyards to encourage use of natural gas-fired barbecues.*

Impact 4.7-3 The impact of the project on local carbon monoxide concentrations is considered to be less-than-significant.

The project would affect local concentrations of automobile-related pollutants along streets and at intersections providing access to the site. On the local scale, the pollutant of greatest interest is carbon monoxide. The CALINE-4 computer simulation model was applied to ten selected intersections to estimate future carbon monoxide levels in the project area. The intersections modeled were selected as those having the highest levels of congestion. The CALINE-4 program and the assumptions made in its use are described in Appendix E.

The results of the CALINE-4 modelling for the ten selected intersections are shown in Table 4.7-4. Concentrations are shown for two scenarios: year 2010 with and without the proposed project. The concentrations in Table 4.7-4 are to be compared to the state and federal ambient 1-hour air quality standards of 20 PPM and 35 PPM. Predicted 8-hour concentrations in Table 4.7-4 are to be compared to the state and federal 8-hour standards of 9 PPM.

Concentrations in 2010 without the project meet all ambient air quality standards. The addition of project traffic would increase concentrations by as much as 0.5 PPM for the 1-hour averaging time and by 0.3 PPM for the 8-hour averaging time, but concentrations would remain well below the applicable standards.

TABLE 4.7-4
PREDICTED YEAR 2010 WORST-CASE CARBON MONOXIDE CONCENTRATIONS,*
IN PARTS PER MILLION

	No Project		Project	
Intersection	**1-Hr.**	**8-Hr.**	**1-Hr.**	**8-Hr.**
Tassajara Road/ Dublin Boulevard	6.9	4.7	7.0	4.8
Alcosta Boulevard/ Bollinger Canyon	5.6	3.8	5.7	3.8
Hopyard Road/ W. Las Positas	5.9	4.0	5.9	4.0
Dougherty Road/ Bollinger Canyon (N)	5.9	4.0	6.1	4.1
Danville Boulevard/ Stone Valley	4.4	3.1	4.6	3.1
Crow Canyon/ Camino Tassajara	5.6	3.8	6.1	4.1
Dougherty Road/ Crow Canyon Road	5.6	3.8	5.9	4.0
Dougherty Road/ Old Ranch Road	4.7	3.1	4.8	3.2
Hacienda Drive/ Dublin Boulevard	5.7	3.8	5.9	4.0
Camino Ramon/ Bollinger Canyon	5.5	3.7	5.6	3.8

* The CO standards are as follows:

	Federal	State
8 hour	9.0 ppm	9.0 ppm
1 hour	35.0 ppm	20.0 ppm

REFERENCES

Air Resources Board, 1991-1994, *California Air Quality Data*, Vols. XXII-XXV.

Air Resources Board, 1995, *URBEMIS Computer Program Version 5.0: Vehicle-Related Emissions Estimation for Land Development Projects.*

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